University of Alberta

Progress: The Consensus of Meaning in Modeling the Semantic Web

by

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Canada

When I have seen by Time's fell hand defaced
The rich proud cost of outworn buried age;
When sometime lofty towers I see down-razed
And brass eternal slave to mortal rage;
When I have seen the hungry ocean gain
Advantage on the kingdom of the shore,
And the firm soil win of the watery main,
Increasing store with loss and loss with store;
When I have seen such interchange of state,
Or state itself confounded to decay,
Ruin hath taught me thus to ruminate
That Time will come and take my love away.
This thought is as a death, which cannot choose
But weep to have that which it fears to lose.

-- William Shakespeare (Sonnet 64)

Each man
has a way to betray
the revolution
This is mine

-- Leonard Cohen (*The Energy of Slaves,* 122)

"Everything in its right place." -- Thom Edward Yorke

Dedication

I would like to dedicate this thesis to my family and friends for their un-erring love and support over the past three years while I completed my Master of Arts degree. I simply could not have finished this degree without you.

Preface

I would like to preface this thesis by saying that many organizations and people are working toward creating the Semantic Web. This work includes creating metadata standards for databases, the World Wide Web (WWW), and the Internet. By no means is this thesis a comprehensive judgment, criticism, or positive affirmation of their work or efforts. I believe that this thesis can be placed in a small, but developing area of Humanities Computing literature on the Semantic Web. Further, as Information and Communication Technologies (ICT) develop increasingly faster and faster, some of the research in this thesis will necessarily be dated to its current time period. I thank the reader in advance for the due consideration of these limitations.

Acknowledgement

I would like to acknowledge the great advice and support that I received from the Humanities Computing (HuCo) program at the University of Alberta in sustaining the research of this thesis, especially Dr. Stéfan Sinclair, my supervisor, who helped me through to the end of this process. I would also like to thank Dr. Aimée Morrison, Dr. Sean Gouglas, Dr. Harvey Quamen, Dr. Rick Szostak, Dr. Nasrin Rahimieh, Taswar Bhatti, Troy Semeniuk, Jane Wilson, and all of the first year HuCo students for the privilege of their company, their guidance, and their assistance during the introductory year of the program. As well, I would like to thank the Department of English, especially Dr. Diane Chisholm, Dr. Garrett Epp, Dr. David Miall, Dr. Ian Munro, Dr. Michael O'Driscoll, Dr. Maximillian Van Woudenburg, John Ames, and James Gifford, who all provided encouragement and training over the years. I consider these individuals as role models who showed me the path beyond my undergraduate studies.

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This is not an extensive list, and there are many more people to thank. Please understand that anyone's name that is missing from this list has been due to an unfortunate oversight on my part. Ultimately, I am a believer that true friends are always acknowledged for their help in person.

Abstract

Within the interdisciplinary field of Humanities Computing, this thesis project is a twofold genealogical study of progress narratives that are representative of several reviewed works which describe the new Information and Communication Technology (ICT) of the Semantic Web. The first genealogical discourse analysis tracks specific informational flows in Computer Science, Structuralist Theory, and Political Economy for their cross-sections with Humanities Computing research. Analyzing these flows helps to better understand how the progress narrative is emblematic of neo-liberal, Enlightenment, or rationalist projects in those disciplines. In turn, how those disciplines can and do influence Humanities Computing is a major focus of this first critique. A second critique identifies how models of consensus are formulated and described by the literatures of those academic discourse flows listed above. Alternatives to commonly held modes of the progress narrative are identified for how they influence consensus and dis-sensus in Humanities Computing initiatives.

Keywords: humanities computing, philosophy of technology, the Semantic Web.

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List of Abbreviations

AI	- Artificial Intelligence
CHUM	- Computers and the Humanities Journal
DTD	- Document Type Definition
G8	- Group of Eight (The International Political Organization)
GML	- Generalized Markup Language
HuCo	- Humanities Computing (specifically, at the University of Alberta)
HTML	- HyperText Markup Language
ICT	- Information and Communication Technology
IEEE	- Institute of Electrical and Electronic Engineering
IHAC	- Information Highway Advisory Council (of Canada)
IMS	- Instructional Management Systems
ISDP	- Internet System Design Project
ISO	- International Standards Organization
IT	- Information Technology
LLC	- Journal of Literary and Linguistic Computing
MIPS	- Millions of Instructions per Second
NAFTA	- North American Free Trade Agreement
NWICO	- New World Information and Communication Order
OHCO	- Ordered Hierarchy of Content Objects
POS	- Part of Speech
R & D	- Research and Development
RDF	- Resource Description Framework
SATOR	- La Sociéte d'Analyse de la Topique Romanesque
SGML	- Standard Generalized Markup Language
TAPOR	- Text Analysis Portal
TEI	- Text Encoding Initiative
TTT	- Things That Think
UN	- United Nations
UNESCO	- United Nations Education, Scientific, and Cultural Organization
USA	- United States of America
W3C	- World Wide Web Consortium
WTO	- World Trade Organization
WWW	- World Wide Web (or "web")
XML	- eXtensible Markup Language
XSL	- eXtensible Stylesheet Language

I. General Introduction

> The aspect of 'labour' which is commodified in cyberspace is its conscious aspect. Consequently, today's most frenetic and far-reaching legal activities are concerned with the ownership of 'intellectual property'. With the not-so-gradual development of global, privately owned electrospace, an artificial, humanity-wide split is being effected (both technologically and legally) between labours of the muscle and of the mind. The artifacts of consciousness that people produce in the constitution, reconstitution, and transformation of their social spaces are necessarily the commodity-forms of any cybereconomy. I have elsewhere identified this as a definitive aspect of 'hypercapitalism'.
>
> - Phil Graham, "On the Enclosure of Consciousness" (161)

Graham's definition of "hypercapitalism" helps to foreground the cultural, economic, political, and sociological thematic framings for this thesis. This thesis is a study of models of social consensus that are being used for the creation of new Information and Communication Technologies (ICTs) and standards that apply to these ICTs. Specifically, in this thesis, I will use the literature of Humanities Computing and of organizations that are interested in creating the Semantic Web for an understanding of how Canada's ICT policy functions practically. Particular attention will be paid to the affect of the United States of America's (USA) ICT policies on Canada's national and international ICT standards. For example, the Semantic Web is described by its major support group, the USA-based SemanticWeb.org, as "a vision: the idea of having data on the web defined and linked in a way, that it can be used by machines - not just for display purposes, but for using it in various applications."[1] The SemanticWeb.org's machine-focused vision of this ICT is defined rather broadly, and its aims are nothing short of a universal panacea to solve the current limitations of the Internet.

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[1] The SemanticWeb.Org. "Welcome." November 2002 <http://www.semanticweb.org/introduction.html>.

However, despite all good intentions, the Semantic Web may in fact be a highly ordered structuring system for describing Internet documents that is far more limiting and imperialistic than the current version of the World Wide Web (WWW or "web") that is available for the Internet (Bazaar, 1997; Hamelink, 2000; Menzies, 1996). Simply put, the Semantic Web is constructed using a descriptive type of data modeling called metadata, which is, in other words, "data about data."[2] The Semantic Web is being built using metadata because metadata is the initial coding foundation that helped to launch the Internet and "Dot Com" revolutions of the 1990s in the form of the HyperText Markup Language (HTML). Although HTML offered a quick way to place textual material on-line during the initial creation of the web, limitations to the HTML-based web quickly developed. These problems include the invariably well-known difficulties of searching and finding materials on the now vast web, as well as more sophisticated issues for designers, who are working to incorporate surveillance technologies and corporate user services into web documents and portals (Flynn 49).

To solve the web's limitations, the Semantic Web will provide greater functionality than HTML by describing documents in more detail through metadata, and this detail will aid in the systematic ordering of newer forms of electronic texts. The systematic ordering and electronic reproduction processes being developed for the Semantic Web use a relatively new markup language called the eXtensible Markup Language (XML). XML and metadata will be described in more detail throughout this examination of the Semantic Web, especially in a technical manner throughout Chapter One, which is entitled "The Object of Study: The Semantic Web and XML" (Friesan, 2003; Flynn, 2002; Hjelm, 2001).

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[2] W3C. *Extensible Markup Language.* 2003 <http://www.w3.org/XML/>.

My purpose for researching this object of study is to call into question the "progress narrative" (Berland, 2000) embedded within Computer Science discourse, which concerns this innovative technology of the Semantic Web.[3] As a Humanities Computing scholar, I formulated the question of "what might the role of the Humanities be in the creation of the Semantic Web and its new ordering processes?" during a literature review of the *Humanities Computing Yearbook* series (Lancashire,1988;1991). In these earlier yearbooks, two gaps were readily evident: 1) one gap was obviously in literature about the Semantic Web and 2) the second gap was in Humanities Computing literature on the subjects of Social Theory, Political Economy, and Structuralism.[4] In the first case, a gap existed in the literature about the Semantic Web simply because it was non-existent; HTML and SGML were the main coding languages in use during those publication periods, XML was just beginning to develop, and the web was still being created. In the second instance, an apparent lack of Social Theory and structuralist debates, such as in Lyotard (1979) and Habermas's (1962) work, was evident because of the yearbook's obvious emphasis on technological projects.[5]

---

[3] The progress narrative can be defined as "the identification between biological, technological, and social evolution that dominates public discourse on technological achievement and technological change, and thus shapes our attitudes and practices…" (Berland 237) or, as Slack and Wise characterize it, "a teleologically driven conception of history where origins are decidable and origins determine endings" (490).

[4] I take Structuralism to mean the movement based in Claude Levi-Strauss's work of the 1950s and critics who study the structure of artistic creations such as Foucault and Jameson. Social Theory, Political Economy, and Structuralism will all be discussed in more detail below.

Similar to this preliminary investigation, after reading in more recent Humanities Computing journals (Flynn, 2002; Fraser, 2000; Winder, 2002), I came to find these two gaps reflected in those literatures. Again, these gaps were 1) a limited amount of information about this relatively new innovation of the Semantic Web and 2) a shortage of information concerning that of Critical and Social Theory perspectives. In the first case, despite XML being a buzzword that can be identified within many current academic projects in Humanities Computing literature,[6] the Semantic Web, which is based in XML, is still not a main focus of many scholars in the community. Humanities scholars are more specifically interested in "TEI standards," "WordNets" (Vossen, 1998), and "Portals" (Schreibman, 2002), which use similar XML technology. The Semantic Web, therefore, remains predominantly a focus of the business community and learning repository projects (Flynn 58; Friesan, 2003; the SemanticWeb.org, 2003). As an example of the second case, Winder identifies the gap between Critical Theory, Post-Structuralist ideas, and how these fields influence work within the Humanities Computing community.

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[5] For more on these gaps, see Lancashire (1991). However, in brief, I found that only a minor focus was given in this yearbook to Hypertext Theorists such as Bolter (69), Landow (233), and Lanham (538), whose works are extensions of a Critical Theory tradition. However, Media Theorists such as Innis and McLuhan and Philosophical or Social Theorists such as Habermas and Lyotard were not cited in this yearbook at all. General disciplines that were identified as Humanities Computing disciplines included Archaeology, Art History, Biblical Studies, Computational Linguistics, Creative Writing, Dance, Drama, English Language Instruction, Folklore Studies, Historical Studies, Law, Lexicography, Linguistics, Musicology, Natural Language and Literatures, and Philosophy (v). As well, in this yearbook, literary criticism projects fell under the headings Textual Analysis and not Critical Theory.

[6] See "Selected Papers from TEI (the Text Encoding Initiative) 10." *Computers and the Humanities* 33.1 (April 1999).

I believe that the developing interdisciplinary research field of Humanities Computing can, and will be, a vital critical and practical test body for the Semantic Web, especially if Critical and Social Theory are used to influence its development. If Humanists and Humanities Computing scholars do not have a voice in the creation of this new tool, then the Semantic Web may not end up serving the Humanities community to their benefit. The often-reinforced stereotype of the *Two Cultures* (1964) that C.P. Snow describes is an obvious example of a documented split between the Humanities and Scientific academic milieus.[7] Through new interdisciplinary research such as Humanities Computing, this separation has recently come to be directly addressed via collaborative research projects and work that emphasizes both qualitative and quantitative study (Lancashire, 1991; Miall, 1990).

My purpose in analyzing the Semantic Web from an interdisciplinary perspective is twofold: first, I believe that Humanities Computing is an interdisciplinary area which provides scholars, who were reared under a modern disciplinary system, a site from which to question new ICT projects like that of the Semantic Web. And secondly, I believe Humanities Computing research, in many ways, requires reformulations influenced by theorists from the areas of Critical Theory and Structuralist debates of modernism (Latour, 1993), postmodernism (Habermas, 1962; Lyotard, 1979), and hypermodernism (Armitage, Graham, Jordan, 2002; Pfohl, 1992). Such theorists have been affecting, and continue to affect, such wide-ranging areas as Computer Science (See: Chapter Two), Literary Studies (See: Chapter Three), and Political

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[7] For alternative sources to this debate see Mattelart, 2001; Virilio, 2000.

Economy (See: Chapter Four). By questioning the "progress narrative" and the relationships among such things as profit, progress, and secret codes, in creating the Semantic Web, I will argue in agreement with such theorists as Berland (2000), Lyotard (1979), Mattelart (2003), and Virilio (2000), who believe criticism and dissension play a major role in developing both technology and canons of literature. A discipline such as Humanities Computing should, I believe, make more use of these forms of criticism in its interdisciplinary balancing act, which teeters between Humanities and Science, qualitative and quantitative study, subjective interpretation and objective analysis, and consensus and dis-sensus.

II. Methodology: Critical Theory, Genealogy, and System Splicing

> …the wide spread protest against the imbalance in information flows and the US State Department doctrine had the effect of accelerating thinking within the political establishment itself regarding the geostrategic stakes of the information society. In 1977, the US Senate Foreign Relations Committee held its first hearings on the 'information age'. The Committee, presided over by Senator George McGovern, listened to testimony from media managers, corporation heads, academics, trade union leaders and even a former director of the CIA. The hearings endorsed the definition of information as a 'new national resource'.
>
> - Armand Mattelart, *The Information Society* (113)

The broad historical criticism of Mattelart's *The Information Society* (2001) and the case studies found in John Armitage's *Living with Cyberspace* (2002)[8] will be invaluable aids for framing my analysis of the Semantic Web. Their understandings of "informational" flows (Mattelart 113), hypermodernism (Graham 113), and Arjun Appadurai's "global cultural flows" (*Modernity at Large: cultural dimensions of globalization*, 1996) will be used to focus on three particularly useful perspectives for describing the major object of this study, which is the Semantic Web.[9] "Cultural flows" in the hypermodern era are useful models for the critical task of tracking "international movements of people, cultures and commodities that have restructured the means by which individuals establish personal and collective identities."[10] Establishing a collective identity is an important part of any developing discipline such as Humanities Computing. Through studying how informational flows affect and represent a discipline, one can better understand how that discipline can develop a voice which could influence the creation of an ICT such as the Semantic Web.

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[8] For example, Paul Graham's "Space and Cyberspace: On the Enclosure of Consciousness" and Tim Jordan's "Technopower and its Cyberfutures," 2002.

The Semantic Web will be analyzed in the following five chapters of this thesis by researching bodies of consensual social exchange that support its creation in both the cultures of the Humanities and Computer Science communities through tracking and tracing three key cultural flows. As Tim Jordan writes in *Living with Cyberspace*, "A cartography of the powers that circulate through virtual lives can now be drawn; it is a chart of the forces that pattern the politics, technology and culture of societies" (120). Such an interdisciplinary mapping project will require "System Splicing"[11] aspects of

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[9] I take the term hypermodernism to mean the new era of globalized capitalism that uses technology to seemingly collapse time and space in an effort to forward imperialistic forces, as described in the work of Paul Virilio (1995; 2000) and others.

[10] See "Global Cultural Flows." *Robbarts Centre for Canadian Studies.* 2003 <http://www.robarts.yorku.ca/globalculturalflows.html>.

[11] "System Splicing" is my term for a developing theoretical model that I would argue uses elements of hypermodern Social Theory and in Genealogical Analysis. System Splicing can generally be defined as using the best available tactics or maneuvers in criticism from any modern system of analysis, if a particular study warrants it, in order to defend a particular position. Shades of this idea can be found in the work of theorists such Lankshear and Knobel, who describe "Scenario Planning" (2000) as a response to a living on a planet with limited resources and unlimited wants, or in other similar formulations of hypermodernism (Armitage, Graham, Jordan, 2002; Latour, 1993; Pfohl, 1992). System Splicing will be identified as a key survival

Critical Theory, Social Theory, and Genealogical Analysis from a Humanities tradition. I will develop a methodological scaffolding on which to situate this study of the Semantic Web and Humanities Computing using Slack and Wise's recent literature review of the Cultural Studies and Critical Theory traditions (2002). They identify one stream developing in this tradition as a movement "From the Inevitability of Progress to Genealogy" (490).

Genealogical methodology is one that is definitively "opposed to the progress narrative" (489) that capitalist societies have adopted. This methodology is founded in the thought of Nietzsche and Foucault whose works targeted disjunctions and eruptions in philosophical and historical discourses rather than linear or unidirectional models. Specifically, Nietzsche and Foucault identify and articulate disjunctures in order to break down narratives and discourses that support a single, definitive, originating point for any foundational belief system.

Congruent with their task, a genealogical discourse analysis also includes challenging foundational beliefs that argue for necessary connections among such things as profit, progress, and secret codes. Slack and Wise describe and define the Nietzschean and Foucauldian tradition of genealogical methodology, as follows:

> A genealogical method thus displaces the 'object' of study away from an analysis of things (such as a particular new media technology) and toward a patient tracking of the apparatus within which things take on particular meanings and play particular roles. (491)

In other words, this method requires making "maps" and "rearticulations" of how certain apparatuses function and how "objects" develop meanings within certain

---

tactic throughout this thesis, and its definition will be made manifest throughout the course of this analysis.

apparatuses. Slack and Wise highlight the work of Deleuze and Guattari as the latest standard bearers of this tradition.[12]

As a critical tool of investigation, Deleuze and Guattari's "socius" from their counter-cultural work *Anti-Oedipus – Capitalism and Schizophrenia* (1972) will be a valuable term for reading the different bodies, or groups, of interested parties within particular "apparatuses" who affect the construction of the Semantic Web. The theoretical term "socius" can be defined abstractly as a large societal body without organs. The term "body without organs" is meant to convey the mechanical nature of hierarchical orders that humans build into institutions and other organizational structures of control and dominance. In chapter three of *Anti-Oedipus* "The Inscribing Socius," Deleuze and Guattari argue that "To code desire—and the fear, the anguish of decoded flows—is the business of the socius" (139). Is this what the Semantic Web and the institutions that support its growth – institutions which might be identified metaphorically as bodies without organs – are in fact doing: coding desire? And whose desire is being coded: a select elite's? Or will this technology be universal in nature?

Deleuze and Guattari's *Anti-Oedipus* was originally written to combat imperialistic bodies of authoritative power, such as was topical during the 1968 student and labour riots in France. It is my belief that the revolutionary Semantic

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[12] Where Foucault's genealogy in *Discipline & Punish* (1977) focuses on the state apparatus of the penal system or Deleuze and Guattari's *Anti-Oedipus* (1983) focuses on the capitalist society as a chosen apparatus that influences and creates the schizophrenic subject, I have chosen to focus on the educational apparatus that produces subjects, who in turn produce such objects as computers. By no means will my genealogical analysis be as in-depth or elaborate as Nietzsche or Foucault's. Particularly, I will only focus on 1) one aspect of Heidegger's work and his use by Computer Science technologists in their canon of the philosophy of technology literature (See: Chapter Two), 2) on aspects of the postmodern debate between Habermas and Lyotard (Chapter Three), and 3) on aspects of neo-liberalism's affect on the creation of technology in Political Economy literature (Chapter Four).

Web will require revolutionary ideas, such as the socius or System Splicing, to fully express the objectives of a technology that uses such philosophically charged terms as "ontology" and "progress" to code its material and functional existence. Deleuze and Guattari argue that a socius is an inscribing body that demarcates and inscribes upon the bodies of its subjects and not merely one that circulates or exchanges items of production such as in a capitalistic society. In their terms:

> We see no reason in fact for accepting the postulate that underlies exchangist notions of society; society is not first of all a milieu for exchange where the essential would be to circulate or to cause to circulate, but rather a socius of inscription where the essential thing is to mark or to be marked. There is circulation only if inscription requires or permits it. (142)

The term socius is therefore not only a theoretical or critical term, but also a practical term for this study that identifies the object of investigation as the influential social bodies of the Humanities, Computer Science, and Information and Communication Technology (ICT), and how they operate in creating meaning through the Semantic Web. Theorists such as Deleuze and Guattari, who take a psychiatric subject such as schizophrenia and merge it with other sociological, literary, and political criticism, will help in documenting the new terrain that Humanities Computing is venturing into because of their similar interdisciplinary methodology.

Deleuze and Guattari's foundations in Foucault's work are important to highlight because Foucault warned of the technological ordering process and how it functions within institutional apparatuses. His work breaks ground between the disciplines of archaeology, sociology, and historical analysis. His *The Order of*

Things (1970) and *Discipline and Punish* (1975) are mentioned here to offer a brief location alongside that of Deleuze and Guittari for describing and performing genealogical discourse analysis on the ordering of sociological bodies. Foucault writes in *Discipline and Punish* about another institution that orders human life: the prison system. He writes:

> The prison form antedates its systematic use in the penal system. It had already been constituted outside the legal apparatus when, throughout the social body, procedures were being elaborated for distributing individuals, fixing them in space, classifying them, extracting from them the maximum in time and forces, training their bodies, coding their continuous behaviour, maintaining them in perfect visibility, forming around them an apparatus of observation, registration and recording, constituting on them a body of knowledge that is accumulated and centralized. (*Discipline and Punish*, 231)

The notion that ordering and hierarchy are to be suspected as controlling and centralizing units of state power is one that Foucault believes should be questioned by the individuals within any political state. Foucault's study of the prison system prompts further questions in relation to technology such as the Semantic Web. For instance, what kind of "new form" is the Semantic Web antedating? Will the Semantic Web be a "Universal Library" as John Thiem (1999) describes it? Or, will it be the main software for new Artificial Intelligent (AI) agents such as Science Fiction describes? Continuing such an extrapolation, could this ordering lead to a digital prison for humanity only dreamt of in movies such as *The Terminator* or *The Matrix*? Such questions will be answered in due time.

Before addressing these questions in the coming pages, one final methodological source needs to be highlighted: Hardt and Negri's landmark work

Empire (2000), which reinterprets the Critical Theory tradition, is a critique of neo-liberal capitalism. In *Empire*, Hardt and Negri detail their interpretation of the endgame of technology controlled by capitalism, using a neo-Marxist political view. Hardt and Negri believe that a basic function of Empire is imperialism. They write:

> Once we adopt this ontological standpoint, we can return to the juridical framework we investigated earlier and recognize the reasons for the real deficit that plagues the transition from international public law to the new public law of Empire, that is, the new conception of right that defines Empire. In other words, the frustration and the continual instability suffered by imperial right as it attempts to destroy the old values that served as reference points for international public law (the nation-states, the international order of Westphalia, the United Nations, and so forth) along with the so-called turbulence that accompanies this process are all symptoms of a properly *ontological* lack. As it constructs its supranational figure, Power seems to be deprived of any real ground beneath it, or rather, it is lacking the motor that propels its movement. The rule of the biopolitical imperial context should thus be seen in the first instance as an empty machine, a spectacular machine, a parasitical machine. (62)

In other words, Hardt and Negri believe that historical challenges to international public law by nation-states are based in an ontological lacking and a breakdown in the imperial systems of nation-states that are representative of Empires. This breakdown occurs because Power is not in the hands of the people that an Empire is supposed to represent under civil law. Hardt and Negri argue, in a Deleuze and Guattari fashion, that Empire is an empty machine that should be held suspect, especially in its use of technology. This message is not a new one, as will be explained in the following chapters, but an overall question comes from this methodological framework: “is humanity listening to this message?” Hardt and Negri would most likely argue “no,” but their work is meant to champion an awakening to the neo-liberal effacement of civil rights. *Empire* will be another source to aid in the analysis of how the Semantic Web as a developing tool is controlled by the interests of various elite soci and how such cultural messages as the progress narrative flow through the representative discourses of those soci involved in its creation.

III. Organization: Three Soci and Three Cultural Flows

> We see here the simultaneous development of individual power along with domination by digital elites. The embedding of social values in technological tools by elites [...] goes hand in hand with individuals gaining greater abilities to act.
> - Tim Jordan, "Technopower and its Cyberfutures" (127)

Each chapter in this thesis is organized to present different models of consensus in order to methodically argue how consensus is really based in Power designated by certain "soci" above others. These elite "soci" affect the creation of meaningful data structures that make up the Semantic Web. Accordingly, the Semantic Web, as the object of study in this thesis, will be tracked through three canonical discourse flows of three modern "soci" by using the model of hypermodern cultural and informational flows developed by Mattelart (2003) and others (Appadurai, 2001: Graham, Jordan, 2002). These soci can be identified as (1) The Computer Sciences (Dreyfus, 1993; Flores and Winograd, 1987), (2) Social and Structuralist Theory (Habermas, 1989; Lyotard, 1979), and (3) Political Economy (Bazaar, 1997; Berger, 2002; Hamelink, 2000; McBride, 1997; Menzies, 1996; Mosco, 1996; Roberts, 2001).[13] Each of these soci will undergo a genealogical analysis that will break down links between the "progress narrative" and technology in their respective literatures.

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[13] In general, these three flows and soci have been identified through my preliminary literature review, as described above, to be keys in creating a complex understanding of Humanities Computing. However, these three areas are obviously not the only means by which this study

This tracking and articulation process will search for disruptive junctures and turbulent marriages that efface the origins of the progress narrative being spliced into their respective canons. A five-chapter breakdown based in this tracking is presented as follows. In summary, the first chapter, which is entitled "The Object of Study - The Semantic Web and XML," is structured to offer a quick introduction to the Semantic Web and XML technologies (Hjelm, 2001; Sowa, 2000). This introduction will be based in a descriptive analysis that provides a Critical Theory emphasis on how the "progress narrative" is a common feature of Semantic Web literature.

Similarly, this "progress narrative" criticism will be carried over into Chapter Two, which is called "FLOW ONE - Computer Science and Heidegger" based on my methodological approach. Chapter Two is a direct critique of the Computer Science canon (Dreyfus, 1992; Flores and Winograd, 1987) and its use of Heideggarian philosophy outside of its historical context (Collins, 2000; Farias, 1989; Milchman, 1996). With an understanding of Heideggarian issues in contemporary philosophy of technology debates, I will turn to an alternate source of modeling the Semantic Web from Humanities literatures based in structuralist and post-structuralist theories.

My focus in Chapter Three, "Models of Consensus and Dis-sensus" will be to present a key debate in Structuralist thought: the debate between Lyotard's

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could have proceeded. For example, historical work, statistical analysis, or visual arts based studies might be other streams to aid in such an investigation.

original formulations of postmodernism (1979) and Habermas's public sphere (1962). Calhoun (1999) and Rorty (1991) will provide disruptions in the modeling of Lyotard and Habermas's respective positions. I believe these are key positions that aid in understanding how Computer Science and the Humanities have been merged under certain political and economic flows of power during this contemporary period of interdisciplinary study; these findings are not dissimilar to those of Winder, who identifies a similar gap in Humanities Computing literature. After all, is it the case in Humanities Computing that Computing Science is having an influence on the Humanities, or vice versa? I advocate a more complex relationship that balances the two approaches through a System Splicing model.

Continuing the analysis of how consensus and public opinion is reached, Chapter Four, which is called "FLOW THREE - Political Economy and Technology," focuses on the Political Economy aspects of this debate (Bazar, 1997; Chomsky, 1988; Menzies, 1996; Mosco, 1996; Roberts, 2001). Particularly, I will search for an understanding of how neo-liberal attitudes and technological issues have become united with the progress narrative to such a degree that ICT is now called a new "natural resource" (Mattelart 113) in the hypermodern era. Further, an understanding of how this unification is an elitist form of cultural Darwinism that can affect the selection and funding of particular projects in Humanities Computing will be developed. Will the Semantic Web, as a "revolutionary" new technology, continue to be aligned with economic powers and military influences that prefigure many such ICT projects, which is the case in Computer Science and major research and development firms (Virilio, 2000)?

Lastly, Chapter Five, "Reconsidering the Role of the Humanities," will summarize how Semantic Web literature has developed in the Humanities (Flynn, 2002; Fraser, 2000; Winder, 2002). This review will help identify what the role of a Humanities Computing scholar might be concerning this new technology. After this review, I will look at how the Humanities originally developed from the movement of Humanism during the European renaissance to its current position, which is now firmly entrenched within international university educational systems. This entrenched position of Humanities Computing has mutated since the *Computers and the Humanities Journal* first came out in 1966 as interdisciplinary practice led to new kinds of scholarship. Overall, I review three ontological models of the Humanism, Humanities, and Humanities Computing using selected textual examples to explain these models (Heidegger, 1947; Lancashire, 1991; Miall, 1990; Rockwell, 1999). For support, a particular descriptive history of the Humanities will be based in research on Dante's *Divine Comedy* (~1307) and C.S. Lewis's *The Discarded Image* (1964). These works will serve as a base for an understanding of how medieval Christian metaphysics influenced the ontological design of that time period's worldview. This history will foreground how the Humanities came to dominate during the Enlightenment period and created an anthropocentric view of unidirectional history, which is a particular formulation of Humanism that still influences such consensus-driven projects as Habermas's public sphere.

If the Semantic Web is not a public or universally accessible part of the public sphere or "informational commons" (Roberts, 2001), then ICT spaces in general will remain another battlefield controlled by economic and political elites in the hypermodern era. This battlefield model of the present situation is one developed from a Critical Theory and Cultural Studies perspective that has not been overtly influential in Humanities Computing literature. However, in the form of metadata, this battlefield may be one that the end-user of the Semantic Web will never see, which creates an identity that we may never know that we had, and that uses a language many would not even know spoke volumes about their lives. After all, will the Semantic Web revolution only serve one particular language game in the elitist scientific field, or for the Humanities, or perhaps for all of humanity?

Chapter One

The Object of Study - The Semantic Web and XML

I. A Critical Review of the Semantic Web and XML

> What is to be done with the left and the right if progress consists in going, as we have seen, from the tangled to the more tangled, from a mix of facts and values to an even more inextricable mix? What if freedom consists in finding oneself not free of a greater number of beings but attached to an ever-increasing number of contradictory propositions? What if fraternity resides not in a front of civilization that would send others back to barbarity but in the obligation to work with all others to build a common world? What if equality asks us to take responsibility for nonhumans without knowing in advance what belongs to the category of simple means and what belongs to the kingdom of ends?
>
> - Bruno Latour, *The Politics of Nature* (227)

Bruno Latour's *The Politics of Nature* (2004) and Manuel Castells' *The Power of Identity* (2004) both discuss "The Crisis of Democracy" that is rooted in the global Information and Communication Technology (ICT) economy (Castells 367). They believe this new era is one that lacks an ethic of care concerning the civil and ecological good of the general population of the planet. These theorists argue that a new ethic of care is required to solve the many issues which have arisen from such institutions as the Humanities and the Sciences when these institutions support neo-liberal "progress narratives."[1] They believe that the modern ideological foundations of such educational apparatuses as the Humanities and the Sciences have changed their original values and now contribute to environmental problems, labour issues, and the improper uses of resources by governments because their representative discourses and informational flows support ICT projects based on technological progress without an ethic of care. As will be argued in this chapter, neo-liberal support for ICT projects comes despite a lack of available evidence that the ICT revolution is helping everyone on the planet, other than businesses and first world nations.

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[1] I use Slack and Wise's definition of a progress narrative here (2002), which is based in Berland's work (2000). They define a progress narrative as a narrative which "holds that the human species – by nature – is developing steadily toward increasing perfection here on earth. And technology has long been seen as a marker of that progress (490).

In the *Politics of Nature*, Latour's many questions about the limits of modernity help to suggest that the objectives of various educational disciplines, apparatuses, and soci are incommensurable with one another to the point that many basic human freedoms are limited by groups disagreeing and arguing (5). Using Latour's ethic of care to reposition Humanities scholarship, the question can be asked, "Why research the Semantic Web from a Humanities Computing perspective specifically?" To answer this question with regard to the civil good, I believe a genealogical analysis of Semantic Web technology is important because the technology that is currently being developed has a number of limitations. These limitations include 1) that certain projects in the Humanities such as those which use web technologies are privileged and funded over other social initiatives (Flynn, 2002; Friesan, 2003; Hedstrom, 1998; Menzies, 1996), 2) that eXtensible Markup Language (XML) technologies like the Semantic Web are restricted by the technical limitations of any Ordered Hierarchy of Content Objects (OHCO), and 3) in a broader critique that certain voices are not being heard or cared for in the global market that drives new technologies (Bazar, 1997; Castells, 2004; Latour, 2004; Mattelart, 2003; Virilio, 1995; 2000).[2] These limitations of XML and OHCO will be discussed more closely in this chapter for an understanding of how the Semantic Web does not address the needs of both Humanities scholars and people outside of academia in many ways.

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[2] The OHCO thesis is an argument that one cannot always describe data content in the ways that one might wish (Renear, 1996). OHCO is discussed at greater length below in regards to Allen Renear's work.

Despite these limitations, the main reason that many technologists advocate the adoption of the newer Semantic Web technology is to solve the current limitations of the HyperText Markup Language (HTML)-based World Wide Web (WWW). The major Semantic Web support group, the SemanticWeb.org, argues that XML technologies can help order and deliver information more readily in today's economy while using ideas of "progress" in a business sense as a basis.[3] On the SemanticWeb.org's website (2004), they describe the many virtues and future uses of "XML and Semantics" without any notion for an ethic of care; instead, they argue that this new technology is more directed towards economic uses:

> The eXtended Markup Language is accepted as THE emerging standard for data interchange on the Web. XML allows authors to create their own markup (e.g. <AUTHOR>), which seems to carry some semantics. However, from a computational perspective tags like <AUTHOR> carries [sic] as much semantics as a tag like <H1>. A computer simply does not know, what an author is and how the concept author is related to e.g. a concept person. XML may help humans predict what information might lie "between the tags" in the case of <trunk></trunk>, but XML can only help. For an XML processor, <trunk> and <i> and <bookTitle> are all equally (and totally) meaningless. Yes, meaningless. *This has direct consequences for economy on the web.*

In a world where new computer languages such as XML are being created and standardized by an elite group of tech-minded individuals, critical works such as Castell's, Latour's, or Armand Mattelart's (2003), are important for an understanding of the post-industrial system, which is driving the political, economic, and cultural machines around us. In Mattelart's *The Information Society*, the history of codes and their use by the military are traced in order to present the argument that a powerful relationship of dominance and surveillance has developed in the Western world from its militarized past. As technology continues to develop, an increasing specialization in the workforce has only limited the number of people who have the access to, and the knowledge of, new technologies that ultimately control and affect the lives of millions of people (Bazar, 1997; Hamelink, 2000; Menzies, 1996).

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[3] See the SemanticWeb.Org's "Welcome" (2002) for their foundational beliefs. However, these beliefs will be discussed in more detail below.

Although the Humanities have often housed avant-garde thinkers who have resisted economic notions of progress, the "progress narrative" which represents the neo-liberal economy has also crept into the work of many Humanities scholars who are interested in new ICT initiatives like the Semantic Web (Fraser, 2000; Flynn, 2002). Alternative focuses for Humanities scholars other than economic "progress" have generally been to use XML as a descriptive markup language for preserving certain precious texts or for providing more descriptive details of texts than was previously possible with HTML technologies (Flynn 49). However, many new endeavors ignore or overlook other Humanities voices such as those found in Critical Theory (Mattelart, 2003; Virilio, 1995; 2000), Cultural Studies (Castells, 2004; Latour, 2004), and Political Economy (Bazar, 1997; Menzies, 1996), which argue that money spent searching for answers to obscure age old problems using ICT might be better spent in areas of scholarship like community projects that work for the emancipation and freedom of the global civil populace.

These issues and limitations that affect the developing Semantic Web will be explored in this chapter in order to provide a basis for broader criticisms in the following chapters. This research is meant to further the objectives of Humanities scholars who would similarly ask that if the current version of the web has not answered the utopian hopes that were originally used to market its value in the global economy (Bazar 1997; Menzies, 1996), then should a new form of this web be touted as a valued solution. I believe that the Semantic Web will provide new technological flexibilities that were not previously available with HTML; however, my aim in this thesis is to introduce voices from Humanities perspectives such as Critical Theory, Cultural Studies, and Political Economy, which are generally not heard in much of Humanities Computing literature. These voices include Armand Mattelart's (2003) and Paul Virilio's (1995; 2000), whose oversight in Humanities Computing literatures can be viewed as an apparent disregard for their valuable criticisms of technology.

As well, I will use close readings of Semantic Web literatures in order to provoke thought about this technology and question what kind of tool is actually being created. I believe that, by exploring various new voices, questions, and gaps in the literature that describes the Semantic Web, this thesis will provide a preliminary grounding for further systematic investigations of the "progress narrative" for scholars interested in a wide-range of issues that are affecting ICT projects in the information age and global economy. As well, alternative paths and formulations to projects such as the SemanticWeb.org's research, which is represented using a progress narrative, will be assessed in order to provide critical restraints and restrictions on the limits of the Semantic Web as a tool of neo-liberal progress. A review of salient issues that concern the use and creation of the Semantic Web will be invaluable to future scholars when Semantic Web technologies and newer markup languages such as the eXtensible Markup Language (XML) are being used by many Humanities projects (Flynn, 2002; "Selected Papers from TEI 10," 1999; Schloen, 2001).

In this critical review of the Semantic Web and its basis in XML, I argue that "progress narratives" and evolutionary language describe much of the documentation of these new ICT initiatives. XML is described "as THE emerging standard for data interchange on the Web" for organizations that are connected to such web initiatives as the SemanticWeb.org's. However, for many on the opposite side of the digital divide, which people such as Heather Menzies (*Whose Brave New World? The Information Highway and the New Economy*, 1996) and Norm Friesan ("Three Objections to Learning Objects," 2003) identify, there exists an ever-widening gap between the owners and the users. This gap has increased to the point that global disparity is a new focus of many national agendas, including Canada (Senate of Canada, 1997). To develop this critical review of the Semantic Web, I will provide a brief explanation of how XML and the Semantic Web have developed (Flynn, 2002; Hjelm, 2001), how they are being used today (Fraser, 2000), and what the hopes are for their future uses (Friesan, 2003). Using this review, I also explore two specific criticisms of the Semantic Web's limitations: 1) its technical limitations and 2) the limitations of developing ICT standards. In Chapters Two, Three, and Four, I look at three broader criticisms of the Semantic Web and ICTs, which focus on the Computers Sciences, Critical Theory, and Political Economy respectively.

II. What is XML? - A Brief History

> A particularly pervasive tendency when discussing new technologies [...] is to treat them as if they were completely revolutionary, capable of (*sui generis* as it were) changing everything and likely to do so.
>
> - Slack and Wise, "Cultural Studies and Technology" (28)

From a cultural studies perspective, the importance of understanding the multiple histories and economic factors that have lead to the development of XML is a required context in which to frame this analysis. As a limitation to this synopsis, despite the arguably long history of Computer Science (Matellart, 2003), I will focus on XML's general development from the late 1960s.[4] According to the *Internet Systems Design Project Report* (1999), XML is a variation of the Generalized Markup Language (GML) that was developed by IBM starting in the 1960s. The Standard General Markup Language (SGML), a formal model of GML, was adopted by the International Standards Organization (IS0) as a standard in 1986, and today's World Wide Web Consortium (W3C) standard of the HyperText Markup Language (HTML) is actually a subset of SGML code.[5]

However, as many have come to realize, HTML was a quick and easy solution that helped to propel the web into its popular format and contemporary dominance. Now that most of the Western world has access to the Internet in some form, the web has become difficult to search because of 1) the relative ease for users to publish materials on the web, and 2) the massive amounts of information that is being published, and 3) HTML's limited descriptive and security capabilities for corporate business and e-governance (Flynn 51, 58). Peter Flynn's history of XML, which is entitled "Is There Life Beyond the Web?" (2002), notes these major limitations for HTML. He describes HTML's limited descriptive capabilities as follows:

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[4] For a brief history of programming languages such as the Hypertext Markup Language (HTML) or eXtensible Markup Language (XML), please see: *The Internet Systems Design Project Report* 1999 <http://www.icaen.uiowa.edu/~bli/xml_proj/final-1.html>. However, as a limitation to this analysis, I will not focus specifically on the development of these coding languages because of the large history that already supports their connection to the American military (Kittler 259) and DARPA (Mattelart 54).

[5] This summary is an extremely brief description of the creation of XML. For a broader description of events, please see the *Internet Systems Design Project Report* (1996); Flynn, 2002; or W3C, 2003.

> The rudimentary markup of the nascent Web in 1991 took 5 years to evolve into the formal definition of HTML 2.0 (HyperText Markup Language) (Berners-Lee *et al.*, 1996), and further 4 years to achieve full ISO status [...]. The first files served on the World Wide Web contained little more than paragraphs, headings, lists, and literal (verbatim) text. (49)

In other words, what was supposedly a simple solution still took ten years to be accepted as an international standard, despite being used readily by programmers since the early 90s; such a time period to achieve recognized international standardization in the world of technological progress seems rather daunting for a ubiquitous technology like HTML. Consequently, Flynn muses at how long it will take for XML to solve these issues and become a standard for the latest version of web technologies.

In evaluating XML's future, Flynn describes XML's past in HTML and how HTML's take-up by businesses lead to a need in 1996 for a new solution to the simplistic nature of the highly used SGML subset, HTML (50). In brief, an HTML tag such as a "Heading tag" like "<H1>" or the paragraph tag "<p>" can be used in only one way; these tags have a direct 1:1 function when read by an Internet browser such as Internet Explorer (IE) or Mozilla. In contrast, XML is not limited in this way: "XML is the Extensible Markup Language (extensible in the sense that, like SGML, it is a metalanguage; and unlike HTML, which is fixed and invariable)" (54). Because of XML's variable and unfixed nature, he argues "with XML, we have a form of SGML that allows complex structures such as TEI files to be used directly by a browser, or via conversion to HTML using vastly cheaper and simpler software than was possible with SGML" (58).[6] In other words, XML has been created to not only help as a coding source for organizing the content of all web documents, but also to provide new ways of searching web materials of complex design. These features are attractive to XML users because XML is easier than SGML to learn, and XML offers more searching possibilities than HTML. Flynn optimistically believes that XML will become the new web standard "Because of the much greater uptake that XML is having in the corporate world than SGML did, XML software is being developed more rapidly" (58).

Using XML, one can create more descriptive tags for web documents than compared to the fixed nature of HTML and also design means for how the content of the XML tags will appear in a browser. Computing groups and organizations, such as the non-profit SemanticWeb.org, see XML's future application as the basic markup language of the Semantic Web. They describe the Semantic Web as "a vision: the idea of having data on the web defined and linked in a way, that it can be used by machines - not just for display purposes, but for using it in various applications."[7] Note the "machine" focused language by the SemanticWeb.org in this statement concerning the uses of this new technology; this language replaces a human subject as the central user, which is a common characteristic of a progress narrative. Similarly, in a technical manual on Semantic Web technologies, another technologist writes of the importance of XML in what can easily be characterized as an idealized "progress narrative": "XML is as close to a global, universal data format as we come today" (Hjelm 3). In short, the Semantic Web can be viewed as an answer to the limitations of current versions of the HTML-based web, despite having only arisen in the early days of this new Millennium as a business-oriented initiative.

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[6] For more about tagging and XML, see the "Text Encoding Initiatives TEI Home Page" 2004 <http://www.tei.org> or "Select Papers from TEI 10." *Computers and the Humanities* 33.1 (April 1999): 1-206.

An understanding of how the Semantic Web has been developed as a convergence of library metadata initiatives and knowledge representation issues is required for a technical description of how it functions (Hjelm 2). The Semantic Web is created using something called a Resource Description Framework (RDF), which "is a format to make assertions—statements that are intended to point something out" (4). To help explicate such abstract components of the Semantic Web as an RDF, Table One helps breakdown the components of the Semantic Web into the following items: 1) RDFs, 2) Schemas or Document Type Definitions (DTD), 3) eXtensible Stylesheet Language (XSL) documents, and 4) XML Documents.

Semantic Web Component	**Material Equivalent**
1) RDF	A Library Catalogue
2) Schema/Document Type Definition (DTD)	Document Type (ie. Article, Book, Photography, Video, etc…)
3) XSL Document	Formatting / Publishing Standards (ie. Margins / Spacing)
4) XML Document	The Written Text (ie. Image, Text, etc…)

Table One: How the Semantic Web Works

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[7] The SemanticWeb.Org. "Welcome." November 2002 <http://www.semanticweb.org/introduction.html>.

In Table One, real-world material equivalents presented aside their virtual electronic Semantic Web counterparts are listed as metaphors in order to help visualize how the Semantic Web works. In general, the two components of a "schema" and a "Document Type Definition" (DTD) can be defined as tools that check for the data-type and structure of various documents; these are tools that can be used to make sure that the XML document that is being created is, for example, a photograph or a music file (Hjelm 105). As well, the eXtensible Stylesheet Language (XSL) can be noted as the formatting side of XML document.[8] Overall, the Semantic Web can be visualized as an ordering system similar to how a library would order and classify books, but in this case, the system is developed for electronic documents.

Flynn notes that, if the general digital community takes up such a system of XML documents and XSL stylesheets, then "In time there is no reason why XML should not become the *lingua franca* for structured text in the humanities and elsewhere" (59). He believes that the only drawbacks to XML systems are that 1) "you still have to learn it," 2) "you have to create a stylesheet to specify how to display your text," and 3) "browsing software is still poorly developed" for displaying XML documents (57). However, it is important to note that Flynn misses a major criticism of XML technologies, which falls under the formal name of the Ordered Hierarchy of Contents Objects (OHCO) thesis (Renear, 1996). Allen Renear, Elli Mylonas, and David Durand describe the theoretical basis of OHCO as follows:

> The process of preparing a machine-readable text is in all essentials exactly like the process of preparing a traditional edition. No edition can be entirely

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[8] I will not go into any further technical definitions of these Semantic Web components as a limitation of this thesis. For more on schemas, DTDs, or XSL documents any technical manual can provide more detail on these XML structures such as *XML for Dummies* (2002) or Hjelm, 2001.

> 'theory-free', although they vary in the extent to which they are tendentious. Similarly for text encoding: no encoded text is strictly speaking 'theory-free', but without text encoding there is no machine-readable text at all. It should be a commonplace that machine-readable texts are 'subjective' and 'interpretative', but not *especially* subjective or interpretative. So we endorse Micheal Sperberg-McQueen's first axiom about the markup used to implement text encoding: *Markup reflects a theory of text.* (263)

In other words, the OHCO criticism of XML's limitations targets the theoretical basis of creating markup texts. The OHCO limitation of XML argues that any hierarchical markup language requires that one has to make decisions about what information is going to be marked up because an overlapping nested markup is not feasible once the stylesheet is completed (264). In other words, what one desires can not always be achieved when designing XML documents, especially because creating certain information structures using a markup language presupposes a hierarchical nature versus other structures like abstract or fragmented postmodern texts, which are easily created in other mediums.

Noting Flynn's oversight of the OHCO thesis is important, especially as he makes a familiar judgment of support for XML technology in concluding his optimistic appraisal of its use by Humanities scholars. Flynn writes that Humanities scholars' uses of XML technologies "should be viewed as an investment in the longer-term future of their discipline, as the methodologies as well as the file formats themselves are designed to be persistent, meaning they will often outlast their creators" (59). Such statements will be addressed throughout this thesis as suspect and as a sign of a "progress narrative," especially given similar statements that were made during the early life of the 1990s web.[9] Skeptically, one wonders how a new technology will solve the long-term issues of 1) file and format interoperability and 2) file storage and retrieval, which are similar problems that have hindered HTML and SGML projects. With such issues in mind, what might be considered a "longer-term future" in the ever-quickening time of hypermodern culture?

III. How is XML being used today?

> It is a process of evolution. At first it seems that we are doing little more than replicating old technology but as the use evolves, and as the technology itself becomes ingrained, we look back and realise not only how dependent on digital resources are many of the courses that we teach but how the application of communication and information technologies is changing the discipline itself.
>
> - Michael Fraser, "From Concordances to Subject Portals" (277)

Like Flynn's work, Michael Fraser's article "From Concordances to Subject Portals" (2000) also comes from the *Computers and the Humanities* (CHUM) Journal; however, Fraser's work is more recent and speaks to the e-learning/distance learning revolution. Fraser's use of a "progress narrative" in the form of the statement "a process of evolution" (277) demonstrates the prevalence of such narratives not just in technological writing as was presented above, but also in the Humanities. Such a use of a progress narrative in the Humanities might be surprising to those unfamiliar with CHUM or for those at the *avant garde* of Humanities scholarship. However, in Fraser's work, concordances and subject portals are two means of using XML to its full "evolutionary" potential. Despite the similar histories of concordances and subject portals to that of the Semantic Web, his article does not mention the Semantic Web. He does note, however, that "The Text Encoding Initiative has driven SGML, and soon probably XML, to its limits by beginning with the needs of the humanities and making computers motivate scholarship rather than the other way round" (270).

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[9] See Chapter Four for more on the early life of the WWW.

Importantly, in his statement, Fraser privileges the Humanities over that of computers to the point that the Humanities out-use the technology; he also recognizes XML as an emerging standard, which is similar to Hjelm and Flynn's appraisals.

In general, standards are important as signs of social consensus, but the question arises of how XML or the Semantic Web does in fact become a standard, normalized initiative for any community. *The Metamap* (2003), developed by Véronique Moal and James Turner, presents a visual representation of the many organizations that have an interest and influence in creating new XML data standards such as the Semantic Web (see Figure One below).

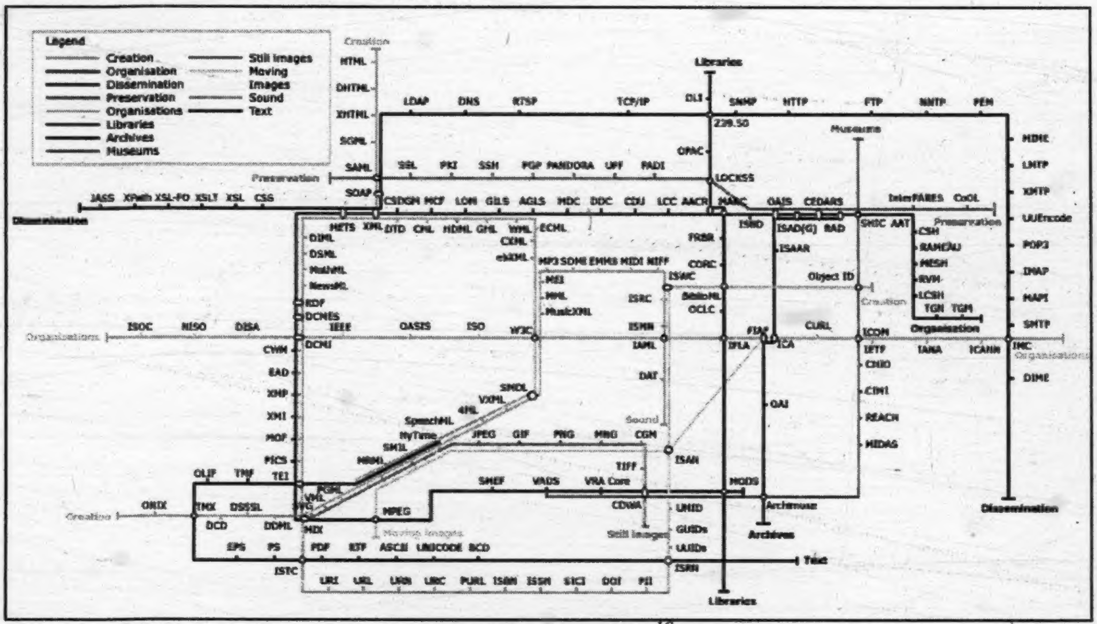
Legend
Creation
Organisation
Dissemination
Preservation
Organisations
Libraries
Archives
Museums
Still images
Moving
Images
Sound
Text
Creation
HTML
DHTML
XHTML
SGML
SAML
SOAP
Preservation
LDAP
DNS
RTSP
TCP/IP
DLI
Libraries
SNMP
HTTP
FTP
NNTP
PEM
239.50
Museums
OPAC
SSL
PKI
SSH
PGP
PANDORA
UFF
PADI
LOCKSS
JASS
XPath
XSL-FO
XSLT
XSL
CSS
Dissemination
CSDGM
MCF
LOM
GILS
AGLS
MDC
DDC
CDU
LCC
AACR
MARC
OAIS
CEDARS
InterPARES
CoOL
Preservation
MIME
LMTP
XMTP
UUEncode
POP3
IMAP
MAPI
SMTP
DIME
METS
XML
DTD
CML
HDML
GML
WML
ECML
CXML
ebXML
DIML
DSML
MathML
NewsML
RDF
DCNES
FRBR
CORC
ISBD
ISAD(G)
RAD
SHIC
AAT
CSH
RAMEAU
MESH
RVM
LCSH
TGN
TGM
Organisation
ISAAR
MP3
SDMI
EMMS
MIDI
NIFF
ISWC
MEI
MML
MusicXML
ISRC
BibloML
OCLC
Object ID
Creation
Organisations
ISOC
NISO
DISA
IEEE
OASIS
ISO
W3C
ISMN
IAML
FIAF
IFLA
ICA
CURL
ICOM
IETF
IANA
ICANN
IMC
Organisations
DCMI
CWM
EAD
XMP
XMI
MOF
PICS
TEI
DAT
CNIO
CIMI
REACH
MIDAS
OAI
SMDL
VXML
4ML
SpeechML
MyTime
SMIL
MRML
PGML
VML
SVG
JPEG
GIF
PNG
MNG
CGM
Sound
ISAN
TIFF
OLIF
TMF
ONIX
TMX
DSSSL
Creation
DCD
DDML
MIX
MPEG
Moving images
SMEF
VADS
VRA Core
CDWA
MODS
Archimuse
Archives
Dissemination
Still images
UMID
GUIDs
UUIDs
EPS
PS
PDF
RTF
ASCII
UNICODE
BCD
Text
ISTC
URI
URL
URN
URC
PURL
ISBN
ISSN
SICI
DOI
PII
ISRN
Libraries

Figure One: *The MetaMap*[10]

The MetaMap's subway-like design is an attempt to visualize how all of the varying organizations invested in using the WWW and Internet are connected. As well, on *The MetaMap* website, a brief description of each organization and links to their representative home pages are available. Like HTML, the ubiquity of XML serves many communities because XML is a free common "metalanguage" for programmers to use. As a markup "metalanguage," XML serves two functions: one function is to describe WEB documents and the other function is to format this content.[11] In other words, XML is metadata, or "data about data" (Hjelm 3). Therefore, XML's applications are only limited by the imaginations of the people who use it, and *The MetaMap* displays the huge variety of organizations that are affecting the use and creation of XML applications like the Semantic Web.

Overall, the current impact of XML has been as a source for the creation of databases in the sectors of Business, Computer Sciences, Education (specifically, Learning Objects: see The MERLOT Project, 2004 or The Belle Project, 2004), Health, and Library classification systems.[12] XML's ubiquity is evident in its spread to common database software such as *Oracle*, which is now offering XML as a part of their basic software packages. As well, proprietary Semantic Web developing suites such as *Ontopia* or *XMLSpy* are being sold.[13] Similarly, in Peter Flynn's "Is there Life Beyond the Web" (2002), he notes that the corporate influence on XML technologies is also influencing the Humanities:

> Because of the much greater uptake that XML is having in the corporate world than SGML did, XML software is being developed more rapidly, and it should be easier and quicker for humanities users to encode and make available texts for researching and teaching. (58)

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[10] Turner, James and Véronique Moal. *The MetaMap*. University of Montreal, 2003 <http://mapageweb.umontreal.ca/turner/meta/english/metamap.html>.

[11] A "metalanguage" is one that can be both a markup language like HTML, as well as one that "is a set of rules for creating markup languages" (Hjelm 5).

[12] These organizations are described on *The SemanticWeb.org*'s home page: <http://www.semanticweb.org>.

[13] See: "The Oracle Home Page." *Oracle Corporation*, 2004 <http://www.oracle.com/>, "The Ontopia Home Page." *Ontopia*, 2004 <http://www.ontopia.net>, and "Integrated Development Environment (IDE)." *XMLSpy*, 2004 <http://www.altova.com/products_ide.html>.

In other words, the corporate world is a major player for driving not only new XML technologies, but also technologies that affect the Humanities and the general populace. This is not a new occurrence, however, as many theorists including Flynn and Mattelart point out.

Despite questions of XML being influenced by corporate business and its usefulness in the long-term, forays into the use of XML in an academic setting have offered unique solutions to developing textual visualizations and software applications, which could not previously have been contemplated. For instance, XML has helped academics in their development of new areas of study like Computational Linguistics, Literary Theory, and Text-Analysis (see Table Two below for a quick review).

The Sciences	**The Humanities**
1. Artificial Intelligence: - Hjelm, *Creating the Semantic Web with RDF*, (2001) 2. Cognitive Psychology - Finin, "Agents, Trust, and Access on the Semantic Web" (2002) 3. Computational Linguistics: - Sowa, "Ontology, Metadata, and Semiotics," (2000)	1. Literary Theory: - Renear, "Refining our Notion of What Text Really is," (1996) - Winder, "Industrial Text and French Neo-structuralism" (2002) 2. Reader-Response Theory: - Derose, "XML and the TEI," *Computers and the Humanities* 33.1 (April 1999): 11-30. 3. XML Text Analysis: - Hockey, *Electronic Texts in the Humanities*, (2000) - Schriebman, "Computer-mediated Texts and Textuality: Theory and Practice" (2002)

Table Two: How XML is used Today

In Table Two, these publications listed above are reference sources that provide descriptions of a few ways that new uses of XML are prevalent in academia. A specific example of XML's innovative impact on academics includes Allen Renear's theoretical approach to questioning whether text is in fact an "ordered hierarchy of content objects" (OHCO, 1996) versus other structuralist or postmodern notions of text.[14] In the Sciences, artificial intelligence, cognitive psychology, and computational linguists are using XML as a language for the modeling of intelligent information systems, which may provide us with a better idea of how humans use language (Sowa, 2000).

In reviewing these literatures, I found that theorists generally agree that if XML were used within only one discipline, then these new solutions and fields would not have developed. Similarly, the problems of the HTML-based web's organizational deficiencies will require a multidisciplinary, collaborative process, which many in the Information and Communication Technology (ICT) field favour (Flynn 49). Such an approach is evident in the Humanities Computing literature that has been reviewed thus far (see Table Two and the Introduction to this thesis) and is also exemplified in the Semantic Web project's influences of library science and knowledge representation (Hjelm 3).

IV. How will XML be used?

> A norm or standard is that which allows the parts to be integrated into a whole. Whether technical or behavioural, norms and procedures determine the criteria of organizational efficiency. (Mattelart 17)

According to Mattelart and other cultural theorists (Slack and Wise, 2002; Virilio, 2000), the search for a universal language, which developed from the Enlightenment form of reasoning, has lead to the automating of systems based on a cultural elite's search for mechanisms to create a stable, hegemonic society. In Mattlelart's long analysis of this history, he highlights Charles Babbage's discussion of the telegraph in one early example. In 1832, Charles Babbage wrote the following words about telegraphs: "These machines have generally been established for the purposes of transmitting information during war, but the increasing wants of man will probably soon render them subservient to more peaceful objectives" (qtd. in Mattelart, 34). Indeed, Babbage was correct about the diffusion of telegraph technology in one sense: its peaceful uses in international communication. However, its use has been far from universal, like most technologies that are available on the global market. Similarly, it is easy to hear Babbage's comments as shadows of a utopian technological solution similar to those that are being made about today's communication technologies.

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[14] Chapter Three of this thesis discusses postmodern ideas of text and structure in more length.

Theorists such as Menzies (1996), Bazar (1997), and Friesan (2003), provide well rounded reviews of ICT issues and oversights in ICT policy at the Canadian national and international levels. As well, they make specifically targeted attacks on the utopian rhetoric that has been highlighted thus far in the form of a "progress narrative." For instance, Menzies argues that technology is a social construct and, therefore, deterministic in nature, "imposing the values and biases built into it" back onto human social arrangements (27). The Internet revolution in Menzies' opinion has not been universal and "Instead of universal connectivity as a rich knowledge and cultural network, it could mean a newly de-institutionalized workforce employed in virtual workshops" (37). Menzies charts Canada's governmental support and reliance on ICTs to the tune of $3 billion each year since the early 1990s (153).

While Menzies's work focuses on the national level, Bazar's work focuses on the international level and how Western governments' lack of aid in creating the universal diffusion of the Internet and web into developing countries is problematic in an era of global economics. Bazar argues that the main institutions that can help to combat the digital divide are governmental. However, in developing countries, even these basic institutional frameworks are not stable enough to support the "capital resources," "management skills," or "environmental factors" necessary to the infrastructure of a stable Internet environment (4). Further, when Western governments are more interested in achieving things such as "interoperability" and "full implementation" of their digital standards, it is difficult to see how any new Internet technology will solve this digital divide.

Norm Friesan is a representative of Canada's digital metadata standards group called CanCore, which is working to create Canada's version of the Semantic Web, as well as variations of the Semantic Web such as domain specific forms like Learning Objects and educational portals (2003). In general, "Learning Objects" are XML documents that can be used in educational situations and stored in an easily accessible XML database (or Semantic Web repository) so that any educator can readily get access to them. In this context of Learning Objects, Friesan argues that there are three main objections to the successful development of the Semantic Web. His objections can be summarized as follows:

1. An objection to the definition of 'learning objects': "The term 'learning object' suggests neither simplicity, compatibility nor any obvious relative advantage over prevailing teaching practice."
2. An objection to standards and specifications: "…specifications and applications that are truly pedagogically neutral cannot also be pedagogically relevant."

3. An objection to military influences: "The obvious fact is that the goals of public education are radically different than those of the American military."

Overall, Friesan's research involves questioning the massive amounts of money that have been poured into distance education and the automation of learning. Two large examples of these projects are The MERLOT Project (2004) in the United States and The Belle Project (2004) in Canada, which is funded by the larger technological body of CANARIE.[15]

Not surprisingly, the documentation on these project's web sites have direct links to the major players in the formation of XML standards and the Semantic Web. These ties would include the following organizations that are also listed on *The MetaMap*:

1. *The Dublin Core* – An American Metadata Standard. Web Site: <http://www.dublincore.org/>
2. *Institute of Electrical and Electronic Engineering* (IEEE): an American based institute. Web Site: <http://www.ieee.org>
3. *The IMS Global Learning Consortium* – An American Metadata Standard. Web Site: <http://www.imsproject.org/>
4. *International Organization for Standards* (ISO) – The International Standards Body. Web Site: <http://www.iso.ch/iso/en/ISOOnline.openerpage>
5. *World Wide Web Consortium* (W3C) – The Creators of XML. Web Site: <http://www.w3.org/>

I list these specific organizations here to suggest the polyphony of voices that are directly interested and active in creating the Semantic Web. With Friesan's objections in mind, it is easy to see how directed economic and political interests in new ICT tools and applications rely on how national and international standards for XML interoperability are created (please see Figure Two below).

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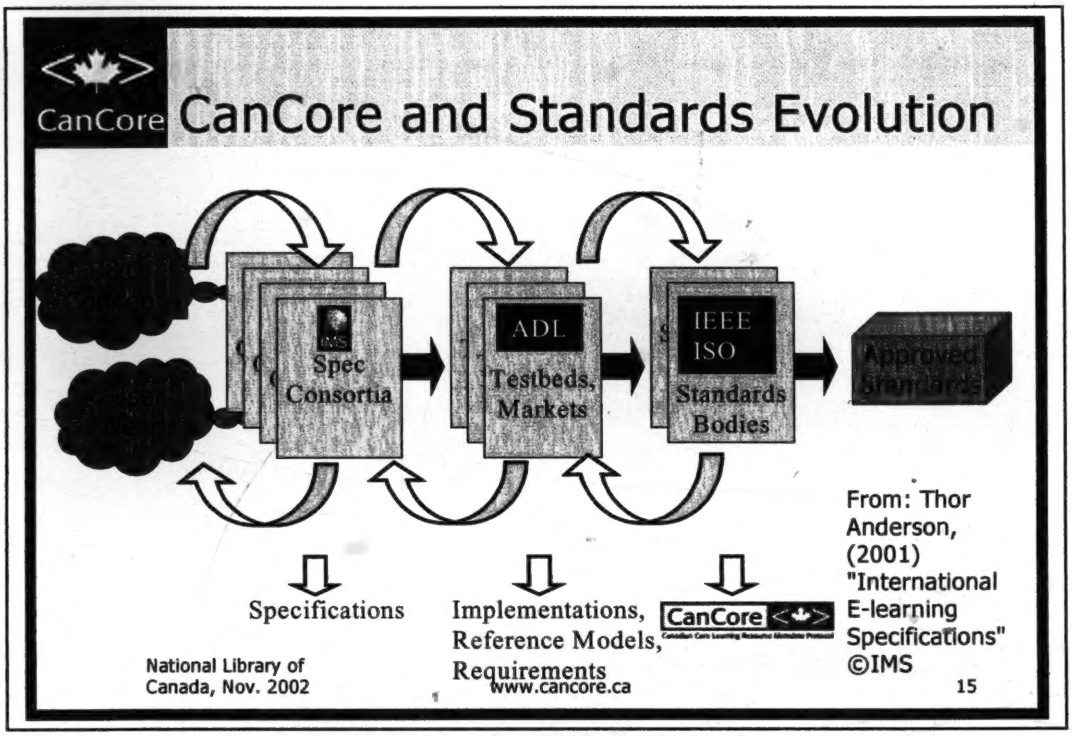
[15] Both The MERLOT Project and The Belle Project were mentioned earlier as examples of how XML is helping to provide greater organization of WWW materials. CANARIE is a major Canadian government initiative to help create the Canadian information superhighway; their funding includes support for The Belle Project. CANARIE will be discussed in relation to Heather Menzies' work in Chapter Four. For more on CANARIE see: "Welcome to CANARIE." CANARIE. 2002 <http://www.canarie.ca/>.



CanCore

CanCore and Standards Evolution

Specifications

Implementations,
Reference Models,
Requirements

CanCore

From: Thor
Anderson,
(2001)
"International
E-learning
Specifications"
©IMS

National Library of
Canada, Nov. 2002

www.cancore.ca

15

Figure Two: How Standards are Formed

Figure Two is a visual representation of how CanCore's standards are a part of a larger international effort. In Figure Two, organizations such as the Institute of Electrical and Electronics Engineering (IEEE) are referenced, which demonstrates a large bias and the influence of the Sciences on this international project. Matellart's critique of technology, which I described above, has already formulated a historical perspective that links the Sciences, technology, research and development (R & D), and progress with relationships that have many military and political underpinnings.

Overall, Friesan's critique of XML learning objects can be viewed as similar to Matellart's cultural critique of technology because Friesan also notices the military connections to which new XML technologies are attached. But should we place much credence in this relationship? Indeed, I argue in agreement with Friesan, Mattelart, and others (Slack and Wise, 2002; Virilio, 1995; 2000) that we should, especially when *WIRED* magazine describes one project that could use XML repositories and most likely become the ultimate in military and hegemonic intelligence/surveillance powers ever created.[16] This project is Doug Lenat's "revolutionary" CYC project, which is an attempt to code common sense into a computer.

As Lenat describes in his interview with *WIRED*'s Geoff Goldsmith, CYC could very well use these new XML repositories for its knowledge base. With its documented military connections and financial support, aspects of Lenat's project are highly confidential and protected. However, the future that Lenat describes in CYC is something few thought could be realized within our lifetimes. Lenat states of CYC:

> I think it's conscious now. If someone acts sane, I assume they are. CYC has models of emotions, seeking-behavior, a list of goals for itself - like finding out about the world, or preserving its own integrity, its self, if you will. (1)

In other words, Lenat's CYC very much has the potential to fulfill science fiction fantasies. Or, in Lenat's own mind, it already has.

Lenat's enthusiasm for technological innovation runs contrary to the ideas of theorists like Mattelart or Virilio. For example, Virilio's writings are careful trackings of how technology is irreparably hurting the human experience. In *The Art of the Motor* (1995), he warns that speed, silence, and secrecy have become so linked that the logical end of the progress narrative taken into practice and culture is annihilation. He writes:

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[16] Goldsmith, Geoffrey. "CYC-O." *Wired* 2.04. April 1994 <http://www.wired.com/wired/archive/2.04/cyc-o.html>.

> *Speed* guarantees the *secret* and thus the *value* of all information. Liberating the media therefore means not only annihilating the duration of information—of the image and its path—but with these all that endures or persists. (53)

Virilio's warnings are, without a doubt, imperative when projects such as Doug Lenat's CYC continue with their military connections. The Semantic Web project by extension of the WWW's connection to DARPA would also fall into this category of potential technologies for an *Information Bomb* (2000) explosion, which Virilio outlines in his later work as similar to the Y2K virus, but more drastic in nature (101).

Arguably, the Semantic Web is the application that could succeed in aiding Lenat's project of making all human knowledge machine-readable and machine-understandable. In Figure Two, the "Big Picture" of Semantic Web implementation is displayed, which is taken directly from the SemanticWeb.org's web site (see below).

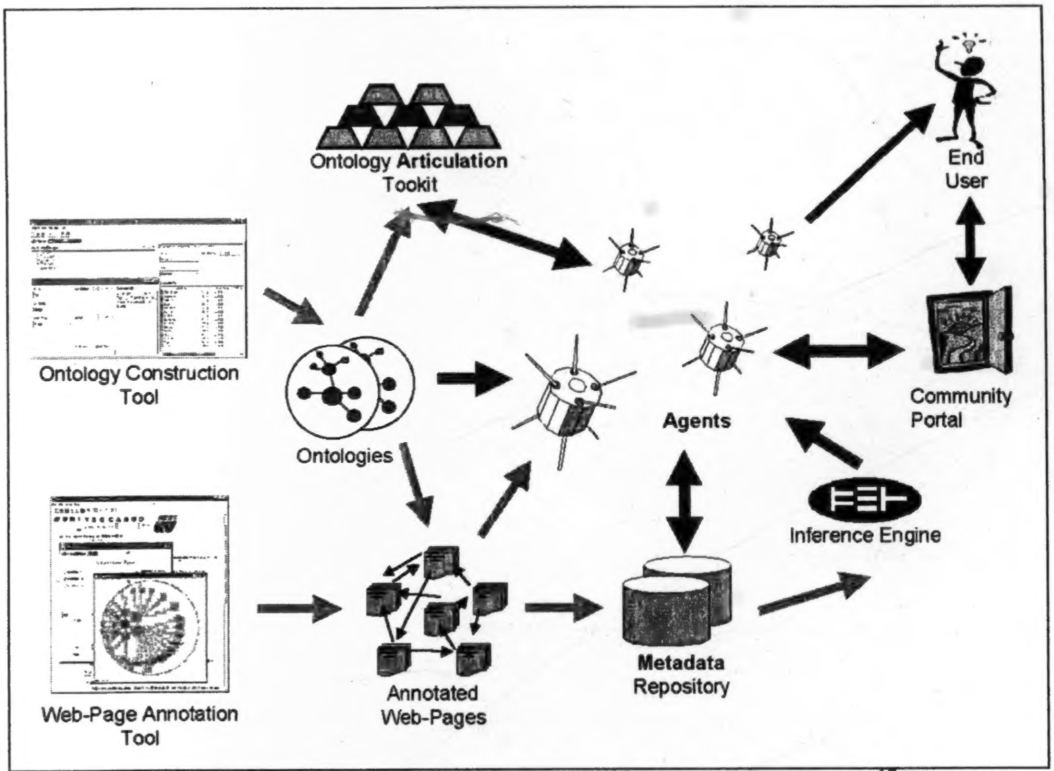
Ontology Articulation Tookit
End User
Ontology Construction Tool
Ontologies
Agents
Community Portal
Inference Engine
Web-Page Annotation Tool
Annotated Web-Pages
Metadata Repository

Figure Three: The Big Picture of Semantic Web Implementation[17]

In Figure Three, "metadata repositories" (Friesan, Hjelm) and "community portals" (Fraser) are two of several main elements required to complete the SemanticWeb.org's vision, both of which have been previously discussed. Without going into too great a description of these other component parts in Figure Three, I will note that "ontology" will be a main focus of Chapter Five.

Although this "Big Picture" might appear to be daunting and rather large in scope, it truly works out to be as easy as "point and click" once the technology is running. As Figure Four (below) portrays in an easier to understand fashion than Figure Three, whether or not an "end user" receives what they desire is the most important thing, especially in a consumer model.

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[17] See the SemanticWeb.org, 2004: <http://www.semanticweb.org/about.html#>.

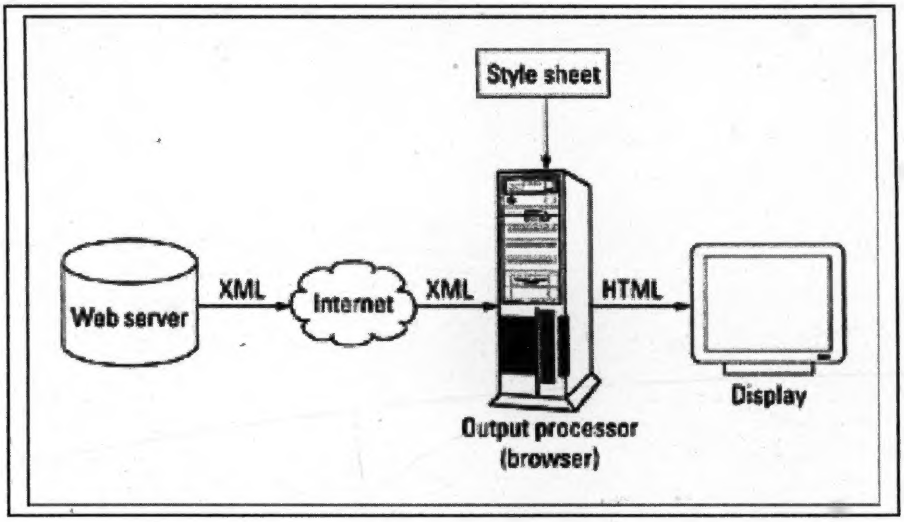

Figure Three: The Little Picture of how the Hardware Works[18]

In other words, an end user's "display" is the end interface used by a human subject, as is depicted in Figure Three, and one should not forget that the Semantic Web is also a product created for and by humans, despite the machine-centered descriptions, which I reviewed above.

Throughout this analysis, a critique of the historical belief that technology and progress are necessarily linked has helped to problematize the relationships among the Semantic Web, its supporters, and its future uses. This summary has linked the "progress narrative" to discourses in both the literature of the Humanities and Sciences. As Matellart's reading of history describes, ciphers, codes, and secret languages are generally the realm of the military. Those who have helped to design secret languages in the past have held similar interests in also designing and maintaining a two-tiered system of upper-class and lower-class citizens on the planet.

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[18] See *XML for Dummies*, 2002 (Chapter One).

I believe this critique to be of great significance given the supporting evidence that Bazar, Friesan, and Menzies all describe.[19]

V. The Semantic Web and "Revolutionary" Hardware

> Right now, your typical $1000 PC is somewhere between an insect and a mouse brain. The human brain has about 100 billion neurons, with about 1000 connections from one neuron to another. These connections operate very slowly, on the order of 200 calculations per second, but 100 billion neurons times 1000 connections creates 100 trillion-fold parallelism. Multiplying that by 200 calculations per second yields 20 million billion calculations per second, or, in computing terminology, 20 billion MIPS. We'll have 20 billion MIPS for $1000 by the year 2020. (Kurzweil 190)

If Kurzweil is correct in his calculations, then by 2060 people will be able to purchase a computer with as many MIPS as the entire current population of the planet for under $1000. This architecture requires software and innovative data structures in order to fully take advantage of the parallelism that Kurzweil predicts. With XML as the source of the new Semantic Web, there may still be no need to worry that a computer will actually become a self-conscious agent in the sense of an AI science-fiction scenario, because XML does NOT add any meaning to its content that a computer can understand consciously (in any human-centered sense of the word at least). However, projects such as Doug Lenat's CYC and the "revolutionary" statements made in popular magazines such as *WIRED* purport that the future might very well contain a computer that can mimic our consciousness to such a degree that it would be difficult to tell the difference between a human and a machine.

Mattelart's critiques of technologies that erase such boundaries as man and machine, or man and nature, in his work *The Information Society* are but one of many critiques of this industry in which the CYC project has arisen (Slack and Wise, 2002; Virilio, 2000). Mattelart's work highlights various other critics, including Delueze, Ellul, Foucault, and Guattari, who have all found reasons to be suspicious of a necessary connection between science, technology, and progress. Further, as Bazar, Friesan, Menzies, Slack and Wise all point out, no single technology in itself can revolutionize the planet because there are many cultural, economic, social, and political factors - just to mention a few broad factors - that affect the use and diffusion of any technology over that of another. Obviously, XML may be *the* current revolutionary standard in ICT developments; however, it is one of many on a long list for the search to universalize the global information network.

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[19] Such political economy debates will be taken up in greater detail in Chapter Four.

Inevitably, in many ways, Kurzweil and Lenat's world is already upon us. However, I argue, in the coming pages, for a need to balance technology alongside issues of ecology, an ethic of care, and the demands of marginalized citizens, which I believe are common values of Humanities scholars. By understanding the "progress narratives" involved in constructing the Semantic Web, I hope to document survival tactics, values, and strategies that would forgo the end logic which would have Lenat's CYC or the Semantic Web lead to a *Matrix*-type nightmare.[20] Already, in this review, despite my obvious favoritism and bias towards representing discourses where Berland's reading of the "progress narrative" might be useful, many competing voices have been presented. However, I will allow the specific socius of Computer Science to present a stronger voice through its own discourses and informational flows in Chapter Two.

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[20] I take "survival tactics" to mean any form of knowledge that helps humans to live and thrive in the world.

Chapter Two

FLOW ONE - Computer Science and Heidegger

I. Systems Splicing: Genealogy, Critical Theory & Humanism

> The proliferation of personal computers in the 1980s, the establishment of the HTML and World Wide Web in the early 1990s, and the development of software which made it possible to integrate other media with text provided the basis for a flowering of Humanities Computing in the 1990s. (Schreibman 283)

In the informational flow of Schreibman's work, a rosy outlook for Humanities Computing scholars was apparent in the early 1990s as technology continued to develop and was being applied to new forms of research. Despite many positive developments for the field, much of Humanities Computing research has not incorporated such vital Humanities research into its socius as can be found in Critical Theory, Cultural Studies, and Political Economy; these are research areas that generally favor negative views of technology. For example, many scholars worry about the digital divide that continues to grow between rich and poor countries who are not connected to the web (Pfohl, 1992; Menzies, 1996; Bazar, 1997; Hamelink, 2000). As was foregrounded in Chapter One, a key issue in such a hypermodern situation is how theoretical discourse and knowledge are being co-opted into what Berland (2000) calls a "progress narrative" and rationalist tradition. Within such a Critical Theory and Cultural Studies project, I propose a genealogical analysis of the philosophical discourse of technology in the discipline of Computer Science and the early Semantic Web history.[1] I will argue that Computer Science has a generally limited relationship with disciplines outside of its foundations in rational/materialist philosophies, which negatively impacts the social development and use of computers.

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[1] Despite using a genealogical methodology, I should note that my views differ from Foucault's "Structuralist" stance or Nietzsche's "will to power," where both theorists attack Humanist ideals. I look to resituate Humanism using valuable techniques and maneuvers taken from Cultural Studies (eg. Eagleton, Hall, Slack and Wise), which has been influenced by the Neo-Marxist theories of Critical Theory (eg. Adorno, Benjamin, and Horkheimer) and Structuralism (eg. Althusser, Foucault). For a quick summary of these disciplines, see *A Timeline of Critical Theories*, 1997 <http://www.sou.edu/English/IDTC/timeline/uslit.htm>. Such an elaborate project of Humanism's and

Materialism will generally be defined in the neo-liberal profit making sense, where scientific reductionism, capitalism, and progress are aligned into a single unifying theory; this is a theory which leads to the conclusion that technology is the only solution to save the human race from its current hypermodern situation. More specifically, third-way politics, which is also known as neo-liberal politics, is defined as the "perfect ideological vehicle for a transition from a society based on democratic political decision-making to one where many issues are outside politics and are settled by the undemocratic rule of the marketplace" (McBride 18).[2] This fundamentally modern definition of neo-liberal materialism is the guiding force for Computer Scientists and technologists who endeavor to create "Things That Think (TTT)" (Gershenfeld 202) and can be found across the discipline's literature (Flores and Winograd, 1987; Bailey, 1996; Hillis, 1998).

From my Critical Theory and Cultural Studies perspective that was described previously, there are multiple histories and economic factors that have led to the

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Genealogy's theoretical reformulation is far beyond the scope of this chapter; see Chapter Five for a better articulation of this position and my concerns of using genealogical analysis when it overtly displaces the human.

[2] Current research interests in hypermodernism, which is sometimes called ultramodernism, that work to understand the mechanisms and apparatuses of this form of neo-liberal materialism can be found in Pfohl's *Death at the Parasite Café* (1992) or Armitage's definition of "hypermodernism" that describes the present historical condition in order to track modern global cultural flows of metanarratives and information (49). This tracking could also be viewed as a survival tactic to combat the materialist progress narrative prevalent in hypermodern life. Other work in this area would include Latour's *We Have Never Been Modern* (1993) or Bourdieu's structuralist readings of cultural production. For instance, Bourdieu tracks and articulates artistic production and its connection to elite institutionalized practices (*The Field of Cultural Studies*, 1993). Further, Colin Lankshear and Michele Knobel's "scenario planning" as a postmodern survival tactic could be viewed as an alternative theoretical structural that could find similar materialist traces in the literature of Computing Science. For examples of hypermodernism in art, J.G. Ballard's *Atrocity Exhibition* (1970), Kroker's *Panic Encyclopaedia* (1989), or Mark Seltzer's *Serial Killers* (1998) are books that list objects and practices that exude hypermodern characteristics, and include mechanical imagery as critique of neo-liberalism.

intertwining of Computer Science and a modern materialist view of human life. This view influences students and professionals alike who are subjects of the Computer Science discipline (or socius) in the educational apparatus of state capitalism and who in turn create culturally imperialistic objects such as computers or the Semantic Web.[3] I will focus this analysis on the philosophy of technology within the academic apparatus of Computer Science. Specifically, as a contextual limitation for this analysis, the canonical literature (or informational flows) of tech gurus Terry Winograd and Fernando Flores will be surveyed from its general development in the late 1970s. My main interest will be how Computer Scientists use Heideggerian thought as a theoretical foundation in the Computing Sciences to build and produce objects such as computers or tools such as the Semantic Web. As well, a criticism of how computer coding and Web technologies have been developed and linked to elite military projects will be a target of this investigation. In particular, I am interested in tracking how the obvious "progress narrative" of Computer Science found its way into the informational and cultural flows of the Humanities.

In Chapter One, recent marriages and effacements of this narrative were documented in the work of Flynn and Fraser amongst others, and this provided evidence for its inherited value in the Humanities from the work of Computer Science. This point of origin in Computer Science can be found and identified in the course curriculum of Computer Science through close reading. For the sake of argument, I have identified five general streams in the theoretical and philosophical discourse of Computing Science literature in order to simplify a general review of its literature. These streams help demonstrate a more complex historical development contrary to a simplified direct link with materialist ideology. These streams can be identified as follows, and for my purposes, I will focus on the last two streams in my analysis:

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[3] For an understanding of Structuralist theory based in a Marx tradition, see Althusser's *Lenin and Philosophy* (1971). This work defines the state apparatus and how subjects are interpellated within its ideological structures. However, for my genealogical analysis, I will use the post-structuralist ideas of Slack and Wise (2002, see Methodology 6), who cite Foucault as a main theorist and influence in this area.

1) **The Technological Manuals and Applied Research Stream**: This stream is the product of applied Computer Sciences that have scientific reductionism in the form of behaviorism, cognitive science, materialism or rationalism as their most cherished foundations. Theorists who fall within this category would be people that Winograd calls "followers of Descartes, Boole, and Turing" (124). Any hardware development or programming language manual can serve as an example, for instance *JavaScript for Dummies* (1996) or *XML in a Nutshell* (2001). This phenomenon of materialism within Computer Sciences can also easily be viewed in contemporary Computing Science journals such as the *Kluwer On-line* series (2004) or the *Theory of Computing Systems* (1996) electronic resources.

2) **The Materialist *Wired*-Magazine-Buzz-Word-Generator Stream**: Just to name a few, I would identify theorists such as James Bailey (*After Thought*, 1996), Neil Gershenfeld (*When Things Start to Think*, 1999), George Guilder (*Telecosm*, 2000), Daniel Hillis (*The Pattern in the Stone*, 1998), Kevin Kelly (*Out of Control*, 1994), and Nicholas Negroponte (*Being Digital*, 1995), as individuals who believe that a link between materialism and social progress is a matter of fact in the Computer Science discipline. This category is distinct from the applied stream for its subject matter relies more on describing the potentials or utopian possibilities of technology than creating a more robust, complex view of technology's connection to political and economic domination.

3) **The Computer Ethics Stream:** Terrell Ward Bynum's "A Very Short History of Computer Ethics" (2003) provides a good synopsis of how computer ethics are still forming today. He describes how Computer Ethics have become an increasingly pressing issue based on the fact of Medical Science's issues surrounding new technologies such as those used in abortion and genetic manipulation. Because of the Medical field's experiences with creating ethics around these technologies, Bynum writes that the Computer Scientists are using the Medical field's model to create their own system.

   For a historical summary of Computer Ethics before these recent developments in the Medical Sciences, Bynum believes that one must start with Walter Maner's *Starter Kit on Teaching Computer Ethics* (1978), which was a self-published work that was reportedly ahead of its time and ignored by most in the field until recently. Since Maner, Computer Ethics literature mostly focuses on Intellectual Property laws, Privacy laws, Fair Representation, and Nonmaleficence issues (Severson 1995). Beyond these issues, Bynum describes the "Górniak-Kocikowska thesis" (1996) as the first argument to call for a global ethics in Computer Sciences because of the extent that these technologies can affect the entire planet. Because of the apparent neglect for works of ethics in Computer Science that Maner describes, I have chosen to focus my analysis on the following two streams that document a similar issue to Górniak-Kocikowska's proposed newer ethic.

4) **The Interdisciplinary Stream**: Since the late 1970s, cognitive science and computational linguistics have developed a history of using philosophical justifications for their still predominantly rationalist/materialist Computer Science perspectives. Theorists such as Fernando Flores and Terry Winograd (*Understanding Computers and Cognition*, 1986) have used the theories of Martin Heidegger in an effort to develop such an interdisciplinary initiative. Their work will be a primary focus of this analysis.

5) **The Critical Stream**: Herbert Dreyfus (*What Computers Still Can't Do*, 1992) is a main critic of Winograd and Flores's work, and he picks apart their Heideggerian interpretations in several of his articles (Winograd, 1995). His work will also be a primary focus of this analysis.

These five intellectual streams that I identify are by no means fixed and solid entities; they are meant merely as guidelines that will perhaps help to facilitate dialogue with disciplines outside of the Computing Sciences. For the sake of scope, I will limit my investigation to the fourth and fifth streams because there is a notable gap in supporting literatures for this subject area.

With the exception of the interdisciplinary work of Dreyfus, Flores, and Winograd, a general separation between the Humanities disciplines and the Computing Sciences is not a surprising status quo within the educational apparatus of neo-liberal states. An obvious marker that dialogue is not well established between the Computer Sciences (or the Sciences in general) and the Arts community in North America can be found by performing quick searches on the *Modern Languages*

Association (MLA) and *Project Muse* databases (March 2004, see Table Three below).

Theorist	**MLA Database**	**Project Muse**
Herbert Dreyfus	0	0
Martin Heidegger	1454	809
Terry Winograd and Fernando Flores	1	6

Table Three: Search Results of Theorists Across Disciplines

In Table Three, the work of the Computer Scientists Terry Winograd and Fernando Flores has obviously not been taken up by an Arts community, as of yet. Beyond Table Three's quick example, C.P. Snow (*The Two Cultures*, 1963) and Mattelart's work both highlight the long history of separation between these two academic communities.

A separation between the research aims of the Arts and Sciences may not be surprising. More interesting, however, are the places where the Arts and Sciences do overlap. As is highlighted in the literature of theorists like Kittler (1999), Mattelart (2001), and Virilio (2000), the "Research and Development" (R & D) arms of big business and corporate education now situate artists within the design aspects of the factory-line: project development, production, distribution, marketing, rollout, and customer feedback processes all have design phases incorporated into their successful completion.[4] This relatively new apparatus in the production of technological objects supports the collision of the Humanities and Sciences, and can be tracked to such unlikely marriages and foundational narratives as Winograd and Flores's use of the controversial philosopher Heidegger. My genealogical analysis aims to provide alternative views of these marriages and collisions through a better understanding of how this particular case occurred despite the differing ideological frameworks for which these academic disciplines are generally known.

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[4] The Research and Development (RAND) Corporation developed in the USA as a military offshoot in 1946 and was the first corporation to establish this trend (Mattelart 50).

Having briefly described my chosen genealogical task, I will hone in on a particularly strange link between Computer Science and the work of Heidegger. In *Understanding Computers and Cognition* (1987), Winograd and Flores self-consciously place their work within the "rationalist" tradition (14); however, their work incorporates interpretations of Heidegger's *Being and Time* (1927) that they read as providing solutions to the prevalent issue of Descartes's binary of the mind-body dualism which permeates much of Computer Science literature. Indeed, Winograd's most recent University course, which was taught at Stanford, "CS378: Phenomenological Foundations of Cognition, Language, and Computation,"[5] in their *Human-Computer Interaction Program*, still looks at Heidegger's philosophy within a Computing Science framework. In contrast, Heidegger has lost favor within the Arts tradition and has largely been under attack for his silence about his commitment to Nazism and his views of the Holocaust (Collins, 2000; Milchman, 1996; Wolin, 2001).

In my review of Heideggerian critics, theorists often find that what Heidegger does *not* say in his work is an glaring sign of his philosophical limitations. I will argue, in agreement with Herbert Dreyfus that, despite Heidegger's abstract, yet ground-breaking, definition of technology, his work can still fall under what Latour (1993) and others might deem a modernist narrative. Dreyfus criticizes Winograd and Flores's foundations in Heidegger's philosophy in this argument because all three scholars shift the focus of technology away from a human-centered ethic of care towards technology as agent and subject. For support of Dreyfus's work, I will use the work of Wolin (1991; 2001), Collins (2000), Kroker (2003), and Losurdo (2001) to identify Heidegger's theoretical limitations and negative silences.

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[5] April 11, 2002 <http://hci.stanford.edu/cs378/cs378-topics.html>.

Continuing this analysis, I will track the articulation of a particularly disturbing "progress narrative" based in Heidegger's philosophical discourse and how Computer Science is using his ideas within its literature. Winograd and Flores's literature will provide the theoretical context within which certain objects, such as computers and secret codes, are produced. Through tracking Heidegger's technological philosophies and his influence on Computer Science literature, I believe that one role for Critical Theory and Humanities Computing scholars must be to facilitate broader, interdisciplinary relationships with the Computer Sciences, while at the same time critiquing their work from a Humanities perspective.[6] This relationship would hopefully work in dialogue to bring more issues such as the digital divide (Menzies, 1996; Bazar, 1997; Hamelink, 2000) and the limits of the "progress narrative" (Robins, 1999; Berland 2000; Slack and Wise, 2002; Matellart, 2003) into the research of both disciplines.

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[6] For a definition of "the Humanities" please see Chapter Five. In general, the Humanities can be defined as studies that have human beings' interests first and foremost as an object of study.

II. Profit: Heidegger and the Computing Sciences

> In sum, Heidegger insists that it is meaningless to talk about the existence of objects and their properties in the absence of concerned activity, with its potential for breaking down. What really *is* is not defined by an objective omniscient observer, nor is it defined by an individual—the writer or computer designer—but rather by a space of potential for human concern and action.
> - Flores and Winograd, *Understanding Computers and Cognition* (37)

Flores and Winograd's understanding of Heidegger removes humans from a central position of control and replaces humans with "a space of potential." Because of this connection with Heidegger's work in a core Computer Science textbook, I will focus my tracking and mapping of the philosophy of technology on how Flores and Winograd use Heidegger's philosophy of technology and ethics (or lack thereof). Following Chapter One's example, this Chapter's tracking process exposes the connections among such things as profit, progress, and secret codes that Mattelart and others (Latour, 2004; Virilio, 2000) describe as becoming a new focus of the prescriptive technologies being developed in Research and Development (R & D) divisions of corporations (Mattelart 161).[7] Winograd presents these well-documented connections between Computer Science and corporations in his "Heidegger and the Design of Computer Systems" (1995), which favors the work of a controversial Humanities scholar in Heidegger over other scholars like Wittgenstein or such contemporary theorists as Lyotard, Mattelart, or Virilio. Indeed, Winograd in a later work (1995) states that Heidegger's philosophy was used simply because it helped computer scientists to visualize and explain certain computer concepts, and he even notes how "The larger breadth of issues that Heidegger addressed in his writing go far afield from the concerns of computer scientists in their technical role" (109). This select use of Heidegger will be important later.

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[7] Prescriptive technologies are technologies that are developed to order and specification without a computer scientist fully knowing how their end work might be used in the broader designs of a defense or military corporation. For more on prescriptive technologies, see Ursula Franklin's *The Real World of Technology* (1992).

However, in a genealogical analysis such discourse is an important indication of the offhand way important linkages between disparate fields are effaced or hidden. Heidegger's rigorous philosophy ends up ransacked by Computer Science only for gems that can be used by the dominant scientific reductionist community. My hope is to disrupt notions that this connection between Heidegger and Computer Science is an easy marriage, which favors the capitalistic pursuit of profit over that of human emancipation. Given the problems of blindly ignoring the "progress narrative" and its uneasy marriages (Menzies, 1996; Bazar, 1997; Hamelink, 2000), it is difficult to see how technologists like Flores and Winograd might use selected theories of Heidegger's, whose phenomenological philosophy had a strong technological critique as a central component.[8]

In a Humanities tradition, a theorist's work is generally applied in full detail or reformulated upon new findings by a disciple of that theorist (Thiele 9). However, in their interdisciplinary leap, Flores and Winograd choose to selectively use Heidegger where they feel his ideas explicate their own and leave aside issues that "go far afield from the concerns of computer scientists in their technical role" (Winograd 109). Indeed, Winograd argues in his later article entitled "Heidegger and the Design of Computer Systems" (1995) that how Heidegger's philosophy is used by Computer Scientists to explicate key Computer Science concepts is not important. He highlights a common dismissal as, "That's not Heidegger, it's just common sense"

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[8] For more on Heidegger's technological critique, see Chapter Four, which includes an analysis of Heidegger's "The Question Concerning Technology," 1953.

(125). These later statements come as a defense of their earlier work which Dreyfus critiques in his larger analysis of the Computer Science discipline, entitled *What Computers Can't Do* (1972). Their early ideas were deeply rooted in Heidegger's philosophy, and because Flores and Winograd disagree with aspects of Dreyfus's critique of their originating point in Heidegger, they reformulated their earlier work with these looser connections (Flores xiii, 32; Winograd 109).

In his critique of their work, Dreyfus identifies four classifications of intelligent activities in life forms in order to create a model for understanding both how people make decisions and how computers might do so eventually as well. These classifications are as follows: 1) Associationistic, 2) Simple-Formal, 3) Complex-Formal and 4) Non-formal (292). Without going into great detail about his classification system, it is important to note that the "Non-formal" classification of intelligent activities includes the characteristic behaviours of understanding complex activities such as "human language" capacities and using "common sense" frameworks of the world. Non-formal intelligence is important because it cannot be programmed into a computer in any way at present, which Dreyfus argues as one of his main attacks on the Computer Sciences optimistic R & D objectives in this area. Dreyfus uses Heidegger in this critique of how common sense is in fact a very complex thing. He writes:

> Heidegger calls it [common sense] *rechnende Denken*, "calculating thought," and views it as the goal of philosophy, inevitably culminating in technology. Thus, for Heidegger, technology, with its insistence on the "thoroughgoing calculability of objects," is the inevitable culmination of metaphysics, the exclusive concern with beings (objects) and the concomitant exclusion of Being (very roughly our sense of the human situation which determines what is to count as an object). (212)

Continuing in this analysis using Heidegger's definition, Dreyfus identifies "common sense" programming as both the Achilles' heel and objective of Computer Scientists. Specifically, Dreyfus stresses how, counter to Flores and Winograd's work, Heidegger believed that cybernetic technologies would be the end of philosophy in this practice of calculated common sense if a computer could ever compute its position in the "always ever-changing present" (Winograd 108).

Based on this critique, Dreyfus made an impressive indictment against the Artificial Intelligence (AI), Computer Science, and cybernetic communities back in 1972. In Heidegger's philosophy, Dreyfus argued that this complete calculated common sense would not be possible given the failings and crudeness of technological projects which attempted to grapple with the complexity of Non-Formal intelligence activities. Despite the indictment, Computing Science's work continued; however, the indictment is one with which they are still grappling. The debate between Dreyfus and Winograd also continued. In a later article, Dreyfus chooses these words from Heidegger to foreground his on-going critique of Flores, Winograd, and the limitations of Computer Science:

> The approaching tide of technological revolution in the atomic age could so captivate, bewitch, dazzle, and beguile man that calculative thinking may someday come to be accepted and practiced as *the only way* of thinking. (qtd. in Dreyfus "Heidegger on Technology," 99)

Notably, things have not changed that much today from Dreyfus's original critique. The Computer Science communities mentioned above still endeavor to solve this major stumbling block of common sense (which some fear to be nearly fatal to their corporate powerhouse-funded projects), while ignoring both Dreyfus's and Heidegger's warnings – this ignorance by many Computing Scientists exists because many do *not* care about debates of ethics or how their technology will be used, especially when much of their R & D is represented by neo-liberal progress narratives.

Now, fast forward fifteen years to 1987, when Flores and Winograd write their *Understanding Computers and Cognition* armed with Dreyfus's 1972 account of their discipline's downfall. Using Dreyfus's reading of Heidegger, Flores and Winograd attempt to refocus the rationalist tradition in which Computer Science has been stuck, while still nonetheless scrapping important parts of Heidegger's work, such as his critique of technology. They describe their project of "ontological designing," or in other words, mimicking common sense in computer systems, as follows:

> In ontological designing, we are doing more than asking what can be built. We are engaging in a philosophical discourse about the self—about what we can do and what we can be. Tools are fundamental to action, and through actions we generate the world. The transformation we are concerned with is not a technical one, but a continuing evolution of how we understand our surroundings and ourselves—of how we continue becoming the beings that we are. (179)

A "continuing evolution" of technological innovations in order to transform humans is obviously still a discourse in which they are interested, despite Heidegger's own words against such a narrow reading of technology (see Section IV below). Ironically, one of the major areas in Computer Science literatures for which Flores and Winograd find Heidegger's work useful is his understanding of "breakdown."

"Breaking down" for Heidegger was important for the formal identification of an object's properties. Flores and Winograd describe this phenomenon by using the example of a hammer. They write, "The hammer presents itself as a hammer only when there is some kind of breaking down or *unreadiness-to-hand.* Its 'hammerness' emerges if it breaks or slips from grasp or mars the wood…" (36). In turn, they apply such a reading to computers. Such a reading is an all too common grievance now based in our hypermodern dependence on computers, which they state as, "None of this equipment is present for me except when there is a breaking down" (37). Thus, Flores and Winograd find computer bugs, viruses, and design flaws or breakdowns foregrounded in Heidegger's theories.

In Winograd's later article "Heidegger and Computer Systems" found in *Technology & the Politics of Knowledge* (1995), he highlights newer readings of Heidegger in the Computer Science discipline. He argues that these readings focus on "the more practical everyday notions" in Heidegger, such as "readiness-to-hand, throwness, breakdown, and the like" (109). In all cases, as was earlier suggested, Computer Scientists ignore Heidegger's larger technological criticisms. Winograd notes such a silence by simply saying, "Although Heidegger's work raises fundamental questions about the nature of technology and the technological society, these have entered very little into the discourse of those who develop computer technology" (109). Following this explanation, Winograd expounds on the wide-ranging areas of Artificial Intelligence (109), Nonrepresentational Robotics (110), Usability Engineering (115), System Development Methodologies (118), and Ontological Designing (121), to which these "everyday notions" apply, and to which Heidegger's philosophy has been influential in such a "minor" fashion.

In an essay that directly follows Winograd's work in *Technology & the Politics of Knowledge*, Tom Rockmore offers a damning reading of Heidegger which acts as a political counterpoint to that of Winograd's technology-friendly reading of Heidegger. Rockmore writes:

> My conclusion is that Heidegger's reading of technology is deeply and irremediably flawed since he fails to identify basic elements of technology and conflates the phenomenon in general with technique and art. It is no accident that his reading of technology is flawed. The flaw follows directly from his profoundly antimodernist perspective. (142)

As will be demonstrated in my analysis of discourses surrounding Heidegger's political decisions and theories, Rockmore is not the only critic to express these views. In order to give Heidegger his full due, I will now turn to an in-depth analysis of his philosophical discourse and present an articulation of his work.

III. Deadly Progress: The Controversial Martin Heidegger

> His political example is deplorable. And on the few occasions when he breached his post-war silence, out have come his most notorious comments on barbarism and brutality: mechanized agriculture is in essence the same kind of thing as the manufacturing of corpses in gas chambers; the Holocaust was equatable as a phenomenon to the expulsion of Germans from the Baltic states; mass death from starvation (in China) is 'inauthentic' death; and if the post-war housing shortage was causing widespread human immiseration, people need first to note that their real misery is forgetting to think on being.
>
> - Jeff Collins, *Heidegger and the Nazis* (53)

The philosophical ideas and political practices of Martin Heidegger (September 26th, 1889 – May 26th, 1976) have caused considerable controversy within academia both during his life and afterward. Jeff Collins's *Heidegger and the Nazis* (2000) is a quick read that provides background to the man as a figure, his ideas, and the posthumous "Heidegger Affair." With due consideration, Collins describes Heidegger's documented silences about the Holocaust, his and his wife's anti-Semitism (31), and the Nazi's form of biologically determined racism in the "Final

Solution" against "the jews."[9] Collins also lists Heidegger's many supporters since "his turn" (including Werner Brock, 1949; Walter Biemel, 1973), who attempted to smooth over Heidegger's past, prior to his denazification; as well, he lists his retractors who include Guido Schneeberger, Victor Farias, and Berel Lang. Schneeberger's publication of Heidegger's Rectorial speeches (1962) that highlight Heidegger's deep involvement in the Nazi movement were the beginning of major criticisms of Heidegger's decisions during the second World War. Despite many glaring political critiques of Heidegger (see Table Four below), Collins also offers ways that Heidegger has influenced Post-Structuralist thought (44), as well as Deep Ecology when he defines "Being" as prior to man (41). However, some theorists view this as an anti-humanist narrative (41). I will use Collins's work as a basis for an understanding of the key controversies in Heidegger's life and philosophies.

In summary of Collins, it can be noted that Heidegger's life changed considerably in 1933 with his decision to support the National Socialists. Despite having an average middle-class upbringing, Martin Heidegger's decisions later in his life during his time as Rector at Freiburg University provide a controversial case study in both careerism (13) and the history of the philosophy of technology, because of his key position in the educational apparatus. His own version of the events during that period portray his decision to accept the Rectorship as being made during politically charged times and contextualized in that his commitment to the Nazis was short-lived. Other times, he says that he did not always tow the party line or that he acknowledged his mistake and changed his views when given the opportunity – often, the question is added by his supporters, "how would *we* have responded?" (14).

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[9] "The jews" is Lyotard's term for how he interprets Heidegger's views of the tragic Final Solution, which places Jewish peoples as "others" (9).

Overall, Heidegger was known to be a Nazi and an active intellectual of the Fascist state (22). In one address to Germans students, he stated:

> This will… must be our innermost certainty and never-faltering faith. For in what this will wills, we are only following the towering will of our Führer. To be his loyal followers means: to will that the German people shall find again, as a people of labour, its organic unity, its simple dignity, and its true strength; and that, as a state of labour, it shall secure for itself permanence and greatness. To the man of this unprecedented will, to our Führer Adolf Hitler – a three-fold 'Sieg Heil!' (23)

The Rectorship speeches and the actions of Heidegger after the war are one reason among many for theorists to dismiss his work in the present academic environment.[10] In the Arts and Humanities, Collins notes Jean-Francois Lyotard's *Heidegger and "the jews"* (1990) as perhaps one of the most famous readings of Heidegger because of Lyotard's complex dismissal of both the French deconstructionists' use of Heidegger and the idea that Heidegger's ideas should be completely disregarded (7, 71)..

In his book, Lyotard argues in defense of post-structuralism's use of Heidegger that 1) "one must admit the importance of Heidegger's thought," 2) "one must admit that Heidegger was implicated as a Nazi," 3) "one cannot eliminate one of these conditions for the benefit of the other," and concludes that 4) "one cannot be satisfied with simply acknowledging the coexistence of the two faces of Heidegger" (Lyotard 52). The "Heidegger Affair," which began with Farias's *Heidegger and Nazism* (1987), is known as the debate over whether or not Derrida's post-structuralism and its foundations in Heideggerian thought should be considered as having an ethical basis given Heidegger's own Nazi-supporting ethics before and after the war (Collins 52, 58). As well, the silence of Heidegger is often the point of contention that directly links his philosophical thought with an implied ethics of Nazism, since he never in fact wrote an ethical tract. Other works that document Heidegger's silence are listed in Table Four, "A Sample of Thoughts on how Heidegger's Political Decisions influence his Philosophy" (see below).

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[10] Other reasons include theorists finding fault with his philosophical ideas, regardless of his Nazi support or still following his philosophical investigations, while hating his politics. These reasons will be taken up in more detail below.

1. Victor Farias's *Heidegger and Nazism* (1987) is one of the books that sparked the famous "Heidegger Affair" (Milchman ix).	"My own research has led me to the conclusion that, even had Heidegger seen things differently after his "break' with the genuine National Socialist movement, we ourselves could not really understand his later development without taking account of his evident loyalty to a certain principle that rightly belongs to National Socialism and is conveyed in a manner and style that also belong to it." (7)
2. Berel Lang's *Heidegger's Silence* (1996) characterizes Heidegger in a similarly negative light to that of Farias's.	"Heidegger's letter of denunciation reveals prima facie a man of substantial Nazi conviction. Baumgarten's portrait of Heidegger is different: it shows a man who was driven not so much by political or ideological passions as by personal pettiness, more than usual vanity, and a desire for philosophical glory." (109)
4. Arthur Kroker writes of Heidegger in *The Will to Technology & the Culture of Nihilism* (2003).	Kroker notes that Heidegger is "a thinker very much in political disrepute yet who, I am convinced, is the key philosopher of fully realized technological society, a theorist who provides both a fundamental metaphysics of virtual capital and a searing vision of the twisted pairs of desolation and freedom." (37)
5. Alan Milchman and Alan Rosenberg's *Martin Heidegger and the Holocaust* (1996) is a collection of essays that contains a wide spectrum of Heidegger criticisms by scholars such Berel Lang, Tom Rockmore, and Michael E. Zimmerman.	"... what is most shocking in the Heidegger affair is not the thinker's behaviour, writings, and speeches, during the Nazi epoch, but his silence about the Holocaust in the thirty-one years that he lived, wrote, and spoke, after the destruction of the Hitler-state." (ix)
6. In *Timely Meditations: Martin Heidegger and Postmodern Politics* (1995), Leslie Paul Thiele attempts to read Heidegger's philosophy anew without the influence of his political decisions based in a postmodern framework.	"Commentators have pointed out that Heidegger's own notion of authenticity precludes the separation of his politics from his philosophy. Authenticity does indeed demand a holistic self-understanding and self-accounting. But the lesson to be drawn from Heidegger's discussion of authenticity is not that we should dismiss a person's philosophy on account of his or her politics. Holistic self-understanding and self-accounting demands the integration of one's philosophic and political insights and judgments." (7)

Table Four: A Sample of Thoughts on how Heidegger's Political Decisions Influence his Philosophy

Beyond Table Four's short list of works on Heidegger's life and ideas, the more recent work of Domenico Losurdo's *Heidegger and the Ideology of War, Community, Death, and the West* (2001), as well as Richard Wolin's *The Heidegger Controversy* (1991) and his later effort *Heidegger's Children* (2001), will be used for a summarization of newer Heideggerian debates since Collins's work. I will focus on how several theorists have been led astray in their studies of Heidegger, like Derrida and Wolin, who did know the full extent of Heidegger's commitments.

For certain, Wolin notes that Heidegger was a party member in good standing from 1933 until the end of the war in 1945 (*Controversy*, vii). At the end of the war, Heidegger was not allowed to work in the academy for a total of five years. In 1991, he allowed Heidegger to speak for himself posthumously in the famous *Der Speigel* interview, instead of Wolin writing speculatively of Heidegger's Nazi-commitments, which were only beginning to surface in North American scholarship. Heidegger stated in this interview that his upward shift to Rector was a chosen act and not a replacement of Möllendorf, the previous Rector, based in party politics:

> During the winter semester of 1932-33, he and I often spoke of the situation, not only of the political situation, but especially of that of the universities, and of the situation of the students which appeared to be hopeless. My judgment was this: insofar as I could judge things, only one possibility was left, and that was to attempt to stem the coming developments by means of constructive powers which were still viable. (*Controversy* 92)

This posthumously published interview with Heidegger entitled "Only a God Can Save Us" (1976) is now often found to be very misleading by scholars and somewhat of a cover up. In the interview, Heidegger also informs the interviewer that he was censured by the party and put to work in the military, which only happened to academics who did not tow the party line. He also recounts in this interview that there are records which present the case he did lose faith with the Nazi Party in 1934, and that he resigned as Rector at the University of Freiburg due to his realization he could no longer influence their Fascist ideals from the "inside."

To note, in his later work *Heidegger's Children* (2001), which is based on a study of people who knew Heidegger personally, Richard Wolin rescinded and reframed his earlier supportive analysis of Heidegger. Hannah Arrendt, who had a three-year affair with Heidegger (Collins 31), as well as contemporary theorists such as Losurdo and Wolin, often use the experiences of Herbert Marcuse, who was one of Heidegger's students, for presenting the case that Heidegger's views must be considered in light of his practices in life. Despite calling Heidegger one of the greatest thinkers of our time, Marcuse also offers one of the most notable examples of Heidegger's arrogance in not attempting to at least silence his critics or provide an apology. Wolin writes of Marcuse's experience, as follows:

> In 1947, Marcuse, now in the employ of the State Department, visited Heidegger's Todtnauberg ski cabin. As Marcuse later recalled, their conversation, which centered on recent political events, was "far from pleasant." In their subsequent correspondence, Marcuse reiterated the betrayal-of-philosophy criticism, distinguishing between errors in judgement—from which no thinker is immune—and a conscious disavowal of the vocation of philosophy itself. He implored Heidegger, as the "man from whom I learned philosophy from 1928 to 1932," to express a public word of contrition, a word that would diminish the gruesome blemish on Heidegger's philosophical reputation. (Wolin 166)

Even with such personal prompting by a former student, Heidegger was unrepentant of his silence on such issues for the remainder of his life. Marcuse's claims, among others that Wolin notes, consequently paint the picture of a complex, yet stubbornly unapologetic figure.

In *Heidegger and the Ideology of War* (2001), Domenico Losurdo similarly recounts many threads of Heidegger's writings focused through his theory, politics, and private life. Losurdo constructs the case that Heidegger's ideas of *Being and Time* (1927) in connection to Karl Jasper's "Kriegsideologie" (war ideology: which connects the themes of community, death, and danger) from his *Philosophie* (1932) and Ernst Jünger's "*Der Kampf als inneres Erlebnis*" (or "*The Struggle as Inner*

Experience," 1922) were important intellectual tools of the Nazi Party.[11] As Collins's work similarly summarizes, Losurdo presents how Heidegger was well known for making controversial statements both during and after WWII.

For instance, Heidegger believed that there was no need for "moral indignation" with regards to the concept of a Führer. Führers were a necessary consequence of the oblivion of being, in his opinion (Losurdo 188). Further, Heidegger also made controversial statements about the Holocaust, despite having Jewish friends and supporters before his 1933 commitment to the Nazis, which included the support of his academic mentor Edmund Husserl. In another talk with Marcuse, Losurdo identifies this statement:

> And the gas chambers and the extermination of the Jews? To Marcuse, who raises the issue, Heidegger responds, in January of 1948, that the allies treated the "Oriental Germans" in the same way that Hitler treated the "Jews." The great distance with which Heidegger usually removes himself in order to make judgments upon centuries and millennia of history does not seem to prevent him from taking a position with regard to well-determined events that would seem to be much closer to home. (189)

There is an obvious distinction, however gruesome, that Heidegger misses here: the Germans were not at war with the Jewish people of their own country; and, as Marcuse argues, a philosopher should abhor genocide, and violence, in any context. From these examples, I believe that Collins, Losurdo, and Wolin's works present how Heidegger's theory is both a reflection of and influenced by the Nazi Party. Similarly, these authors allow a reader to judge Heidegger's involvement from the perspective of their own values; though in the end, there is little doubt that one must read Heidegger's philosophy with his enthusiasm for National Socialism in mind.

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[11] For the sake of brevity, I will not go into too much detail about these other philosophers because I will be focusing on Heidegger specifically and also Losurdo's work does more justice to the topic. I mention Jaspers and Jünger's ideas here as examples of German philosophical work that directly influenced the Nazi High Command and are examples of how philosophical theories can be used to help structure and legitimize Fascist politics under a propaganda model of media.

Keeping these theorists' suggestions in mind, Heidegger's work must be considered as connected to his lived practice in a complex approach, which in no way might fully venerate or dismiss him or his works. If Computer Scientists do not even pay attention to these problematic narratives within Heidegger's life when using his work in their research, then one has to wonder to what extent Heidegger's work (and Fascist ideals through that connection) has influenced R & D theories and practices. And further, one might wonder what, indeed, the relationship between theory and practice is, and who is protecting the common citizen from detrimental R & D theories and practices. Heideggerian theorist Thiele's argues, using Heidegger's own logic, "the most drastic way to reject a proposition is not to dismiss it rudely as disproven and merely brush it *aside*, but on the contrary to take it over and work it *into* a fundamental and grounded connection with one's own argument—that is, to take it over and work it in as the nonpresence [*Unwesen*] that necessarily belongs to presences [*Wesen*]" (9). My hope is that through this genealogical tracking of silences in both the discourse of Heidegger's work and that of the Computer Sciences, a worrisome connection has indeed been identified in placing Heidegger's work and the dangerous shades of the "progress narrative" in Flores and Winograd's work into a resituated cry for urgency. This urgent cry calls for political actions and more research into an understanding of how neo-liberal ideals, which are foundations to systems that link profit, progress, and secret codes, are influencing or have influenced R & D in the corporate business climate. As Mattelart argues, corporations abhor regulations, standards, or research of such an ethical kind because "Neither producers nor users in the information-technology market have the time or the patience for regulation" (161). Such issues and relationships in creating technology provide a broader critique of the development of the Semantic Web, especially when Flores and Winograd's "ontological designing" is a foundational part of ICT literatures and also influential in Semantic Web creation.

A reformulation of Humanism could address such shortcomings in Heidegger's work and the Semantic Web (see Chapter Five), although restituting Heidegger must demonstrate how the "Heidegger Affair" and controversies concerning his life's politics are ongoing. Further, theorists should persist in struggling with positioning Heidegger's ideas as new evidence is brought forth against him and how Fascism might have inadvertently (or blatantly) influenced ideas and practices in the Computer Sciences. The important question is if his philosophy can be considered in light of the positive messages contained therein, especially in order to attack and resist the neo-liberal "progress narrative?"[12]

IV. Secret Codes: Heidegger's Thought versus His Practice

> Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it. But we are delivered over to it in the worst possible way when we regard it as something neutral; for this conception of it, to which we particularly like to pay homage, makes us utterly blind to the essence of technology. (Heidegger 312)

Despite his political thought, Heidegger significantly noted how technology can hold detrimental powers for the human experience, especially when it is coupled with ideological power. Heidegger defines the problem from the perspective of phenomenological questioning. An understanding of phenomenology is important to understanding how his ideas have influenced Computer Science, especially given his essay "The Question Concerning Technology" (1953) that is extremely critical of technologists. Phenomenology is a methodological type of philosophical analysis first postulated by Heidegger's dissertation supervisor Edmund Husserl (reworked from Hegel's *Phenomenology*). In phenomenological analysis, a "disinterested observer" attempts to "make manifest what shows itself in unconcealment as what is (at) present" (Heidegger 18). Phenomenology holds as a founding belief that scientific study is useful in mapping a one-to-one relation (or 1:1 ratio) of language and the world.[13] However, the difficulty of naming in language creates a problem of defining the essential character of the world's infinite component parts through the component parts of such a malleable technology as language. Language, of course, is composed of those slippery signifiers: words. Such theoretical issues lead Heidegger to take an ontogenetic approach (the study of being) to his studies. Therefore, he analyzes how things in themselves exist in time in an attempt to create a fundamentally new metaphysics and ontology.

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[12] This is how some contemporary theorists such as Athanasiou (2003), Dreyfus (see Section V below, 101), Johnston (2004), and Kittler (1999) use his ideas to explore modern notions of technology.

Heidegger's "The Question Concerning Technology" is a prime example of phenomenological analysis in his academic work, as well as the most important text for reading the silences in Flores and Winograd's work. This work provides insight into his experience of war and modern mechanization because the lecture that is now recorded as "The Question Concerning Technology" was originally given after WWII, on November 18th, 1953. In the lecture, Heidegger begins by arguing through two previous definitions of technology based on the form of the original Latin word, "techne." Heidegger aims at developing a better understanding of *techne*'s essence throughout his analysis. The two main definitions that help to frame his argument are stated as follows: "Technology is a means to an end" and "Technology is a human activity" (312). Heidegger believes that these two definitions are useful as an instrumental definition and an anthropological definition respectively.

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[13] This "1:1 ratio" is, of course, questioned in genealogical analysis. In Deleuze and Guattari's project, they highlight that this connection is not necessary by how "… the schizophrenic passes from one code to the other, that he deliberately *scrambles all the codes*, by quickly shifting from one to another, according to the questions asked him, never giving the same explanation from one day to the next, never invoking the same genealogy, never recording the same event in the same way" (15).

For Heidegger, however, these two definitions do not adequately present the essence of technology. The actual question in this essay is more a "*questioning* concerning technology" rather than a specific question (311). By analyzing the assumptions contained within these past and modern definitions of technology, Heidegger finds that the essence of technology, or "what technology actually is," is a process of enframing that reorders humanity within a technological hierarchical structure with each new technological innovation. "Enframing" is a process of transformation and Heidegger argues that humans must control this process. He writes:

> The essential unfolding of technology threatens revealing, threatens it with the possibility that all revealing will be consumed in ordering and that everything will present itself only in the unconcealment of standing-reserve. Human activity can never directly counter this danger. Human achievement alone can never banish it. But human reflection can ponder the fact that all saving power must be of a higher essence than what is engendered, though at the same time kindred to it. (339)

Standing-reserve (*bestand*) for Heidegger is, in a primordial sense, the fact that all things are potential energy, or resources, for human activity. Importantly, Heidegger says that "Human activity can never directly counter this danger" of reducing all material things, including humans, into standing reserve. In other words, Heidegger identifies a key worry for the modern century, where humans can become technology as a form of standing reserve. In this way, the concept of standing reserve is similar to scientific reductionism and represents an anti-Humanist view.

In Figure Five (presented below), I attempt to unpack Heidegger's argument in a simplified visual representation using the ideas of Milchman and Rosenberg's "Heidegger, Planetary Technics, and the Holocaust" (1996). Milchman and Rosenberg argue for a questioning of reason and technology as "standing reserve" in the service of irrational projects. They write:

> Modern science and technology, applied to the task of genocide; the bureaucratic organization of the factories of death; and the transportation system which supplied them with their "raw material"; indeed, the very fact that there could be something call "the Jewish problem," requiring a scientific and bureaucratic solution, the "Final Solution," are all ways in which reality can show up for us when it is governed by the principle of reason. Standing reserve is, for Heidegger, the way in which beings are disclosed under the sway of the *principium rationis*. (222)

In this "sway" of reason and scientific reductionism, they believe that Heidegger's standing reserve "illuminates the industrialization of death symbolized by Auschwitz" (222). In Figure Five, I present the distinction that technology is only a tool, which Heidegger develops at the beginning of his argument, and second, I present the case of technology enframing human experience, which is how Heidegger ends his argument.

CASE ONE	**CASE TWO (enframing)**
1. Subject	1. Technology
↓	↓
2. Technology	2. Subject

For Heidegger, first humans create technology (Column 1), and then technology, as an instrument of reason, aids in constructing and structuring subjective reality as a tool, while also enframing the subject in the embodied structuring of its order (Column 2).

Figure Five: An Outline of Technological Enframing

The second column illustrates Heidegger's view that technology can be used to dominate other humans and order existence in a "rational" model, which is ultimately a deadly combination. However, Heidegger, as previously mentioned, never wrote an ethical tract in which to situate his reading, and his life decisions have been read into this void (Collins 52). Milchman and Rosenberg, amongst other theorists listed previously, believe "his failing in this respect is monumental, his responsibility enormous [...] precisely because the nearness of his thinking to the Holocaust could have – in the three decades after the destruction of the Third Reich – given rise to the insight, and altered the very terms in which we envisage the relationship of the Holocaust to our Western, now global, civilization" (231).

Notably, similar to Milchman and Rosenberg's ideas, many believe that the Nazi party did instigate a policy in which human beings were used as technology. The Holocaust is the horrible example of abusive powers that links theory with practice, as well as with profit, progress, and secret codes. *IBM and the Holocaust* (2001) by Edwin Black documents a direct link between using computer technology in the tracking of humans for the purpose of genocide and their use as labour in Nazi death camps. Black writes:

> Nazi Germany offered […] the opportunity to cater to government control, supervisions, surveillance, and regimentation on a plane never before known in human history. The fact that Hitler planned to extend his Reich to other nations only magnified the prospective profits. In business terms, that was account growth. The technology was almost exclusively IBM's to purvey because the firm controlled about 90 percent of the world market in punch cards and sorters. (46)

Herman Hollerith's punch card technology was instrumental in the creation of IBM, as well as the implementation of Hitler's appalling Final Solution, through matching the tattooed identification numbers on political prisoners with their corresponding records. Such Fascist use of technology and the abusive power that controls new technologies have become a dominant fear and concern in the twentieth century.

In Heidegger's view, technology's essential nature is one that enframes the human experience in a controlled ordering. Extrapolating on this view to include the logic of war, technologies of war must enframe the human experience in its own mechanism and reduce the human away completely: turning living humans into dead matter. Milchman and Rosenberg's examination foregrounds such a reading. The scientific bent of phenomenology that Heidegger espouses in "standing-reserve" creates a 1:1 relationship that can easily demonstrate how theorists interpret technology as rolling down the slippery slope of enframing experience into becoming an agent of experience.[14] The apparent link formed in the "1:1 relationship" in phenomenology suffers, however, from a common rationalist lacking or misconception: why does the model of the phenomenological world necessarily map onto the real world?

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[14] The argument that technology has agency, such as in debates put forth by Latour, Grusin, Haraway, or Hayles, should not be confused with Heidegger's idea of enframing. I highlight the agency debate here because I believe that providing technology with agency often leads to an argument of technological determinism. To limit the scope of this essay, I will not delve into this argument in any great detail.

Hardt and Negri describe the problem of rational dialectics mapping directly onto the real world in relation to both Walter Benjamin and Heidegger's work in their neo-Marxian critique of *Empire* (2000). They write:

> Certainly the dialectic, that cursed dialectic that had held together and anointed European values, had been emptied out from within and was now defined in completely negative terms. The apocalyptic scene on which this mysticism searched for liberation and redemption, however, was still too implicated in the crisis. Benjamin recognized this bitterly: "The past carries with it a temporal index by which it is referred to redemption. There is a secret agreement between past generations and the present. Our coming was expected on earth. Like every generation that preceded us, we have been endowed with a *weak* Messianic power, a power to which the past has a claim…" And the powerful shadow of an aestheticized dialectic slips even into Heidegger's notion of a pastoral function over a scattered and fractured being. (377)

I raise Benjamin's views here because I believe that his famed "The Work of Art in the Age of Mechanical Reproduction" (1936) offers an alternative foundation for the future of Computer Science. His alternative formulation is an understanding of how technologies that are built without a regard for their future uses, or without an ethic of care for human beings as a central concern, can only lead to the eventual dehumanization of society. In Benjamin's work, he argues for scholarly research efforts to create a greater civil good. Flores and Winograd might not desire such a reformulation of their work given Heidegger's easy marriage with their research.[15] What might Computer Science do using Benjamin's lesson that politics frames and controls technological reproduction? In a time when Doug Lenat's "revolutionary" CYC project could very well complete Heidegger's prophecy of cybernetics ending philosophy, I believe that theorists such as Benjamin, Hardt, Mattelart, Negri, and

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[15] Benjamin's work is only mentioned here as one alternative. Chapter Three takes up Habermas's and Lyotard's extensions of Benjamin's proto-Critical Theory as variations on this theme.

Virilio offer stronger paths of resistance to the seduction of the "progress narrative" in Computer Science than Heidegger's "The Question Concerning Technology."

In Arthur Kroker's reading of Heidegger, he concludes that art must be a main concern for human survival. He writes:

> Art is the essential survival strategy of digitality today, and perhaps the basic strategy of human life itself. (Kroker 212)

As the proto-Critical Theorist Walter Benjamin noted, art can be used politically, especially mechanically reproducible art. If theory is being co-opted to help create both the artistic and political technologies of tomorrow, should Humanists not be concerned with how these theories are being used by an educational state apparatus built directly into a neo-liberal politic? What might happen given some predictions of technology's future such as are evident in projects like Lenat's CYC, especially when many R & D divisions are linked with military endeavours?

The cybernetic end of philosophy, of which Heidegger's work foretold, may already be upon us. Secret languages, ciphers, and codes may be the precise signs of such an end, as Mattelart's reading of history describes. As well, in this genealogical analysis rooted in Cultural Studies, I believe that Foucault's analysis of the penal system can also be used to shed light on Heidegger's project. Foucault writes:

> The public execution was the logical culmination of a procedure governed by the Inquisition. The practice of placing individuals under 'observation' is a natural extension of a justice imbued with disciplinary methods and examination procedures. Is it surprising that the cellular prison, with its regular chronologies, forced labour, its authorities of surveillance and registration, its experts in normality, who continue and multiply the functions of the judge, should have become the modern instrument of penality? Is it surprising that prisons resemble factories, schools, barracks, hospitals, which all resemble prisons? (228)

If Foucault is correct about these institutional apparatuses, then what might be the logical culmination of Heidegger's philosophy on technology? Might it be a completely automated prison system the likes of which would be unprecedented? Or, might this logical end have already been exhibited in the death machines at Auschwitz as Milchman and Rosenburg argue?

V. Formulating Survival Tactics

> The careless attitude towards the long view, which is rife in discourse on the 'information age', is matched only by the discourse on the 'global age'. (Mattelart 161)

Within a Critical Theory and Cultural Studies tradition, I have developed a genealogical reading that attempts to dispel a current event horizon in the use of Heidegger's philosophy, worrisome progress narratives, and discourse that uses these theories without regard for their ethics in the Computer Sciences discipline. I have argued that the apparatus of R & D that exists in Western culture has several components; one of which is the educational apparatus. I focus on the literature of the philosophy of technology that the Computer Sciences socius has enshrined institutionally as a part of its canon. I have done this in order to critique the educational infrastructure of this apparatus that develops workers and more like-minded supporters of techno-dependency using "progress narratives."

In this analysis of the philosophical literature of technology that Computer Scientists are studying, an emphasis on Heidegger's thought was identified. I believe, as was presented in the works of Collins, Losurdo, and Wolin's, among others, that such a foundation in Computer Science based on Heidegger's resituating of the human must be questioned. If humans are to emancipate themselves from the techno-gods that now rule the planet, which were designed from our own making, such readings become survival tactics which may curb actions and dominant discourses that represent forces leading us to a global environmental collapse. The reemergence of genocide-scale situations such as in Kosovo and Rwanda have been tragic signs that "Lest we forget" seems to have already been forgotten in the hypermodern speed that it took to deliver the original message and lost in the information overload of consumer society. In closing, I will use Heidegger's words to offer a positive spin on the situation and possibly a way out of such technologically determined annihilation:

> We can affirm the unavoidable use of technical devices, and also deny them the right to dominate us, and so to warp, confuse, and lay waste our nature. (qtd. in Dreyfus 101)

I fundamentally believe human nature and human being must be central to solving the technological and environmental problems into which proponents of the "progress narrative" have led us. As Virilio points out in his work *The Information Bomb* (2000), we have long arrived at a time when either the atomic bomb or the population bomb could destroy the entire planet – why do we continue to pursue the information bomb? If this is the case, may future generations write as disparagingly about our present generation, or even about my own baby steps as an intellectual hoping to craft some fundamental survival tactics, as many theorists have written of Heidegger; that is, of course, if we are successful in creating alternative scenarios and systems of existence, and there is still someone around to condemn the decisions of this present technological age.

Chapter Three
FLOW TWO: Consensus versus Dis-sensus

I. Habermas and Lyotard

> I think that a public sphere, in the sense in which I've tried to define it, only arose with the transformation of the split between high culture and popular culture that has been characteristic of premodern societies. A convenient or, in that sense, popular public sphere, emerged only in competition with the literary public sphere of the late eighteenth-century France during the revolution. I have some doubts about how far we can push back the very notion of the public sphere to such a degree that it becomes something else.
>
> - Jürgen Habermas (*Habermas and the Public Sphere,* 465)

If the Semantic Web is to be publicly accessible or reflect public opinion in anyway, then Habermas's famous "public sphere" is an important model of consensus for understanding how the Semantic Web is being developed as an informational flow that is based on the opinions of a variety of social groups. The contents and use of the Semantic Web, like any textual body, will be representative of many forces (and simultaneously exclusive of other groups). For example, the web is now a vehicle of the economy and also provides a forum for a polyphony of voices; however, its initial development by the military is still recognizable in its networked design and the surveillance mechanisms that are available to elite programmers (Kittler 259; Mattelart 8; Virilio, 2000). The design of the Internet from the American military is notable for the fact that the Internet was meant to function in multiple areas in the event of a nuclear attack.

Similar to the web, the Semantic Web will be representative of those who influence its creation. In other words, its informational flows will be representative of the apparatuses and standards that come to bear on its design. The influential forces of Computer Science on its development have already been documented thus far (see Chapter One and Chapter Two). In terms of models of consensus for the many organizations that influence its design, one overriding ontological model for consensus noted in this century is Habermas's public sphere.

Consensus can be "... achieved only if all participants could come to agree on the authentic interpretation of each's needs, and they would have to do so from the very different hermeneutic starting points afforded by a pluralistic and individualistic culture" (Calhoun 61). In other words, compromise among individuals and groups is a major feature of forming consensus. From such a definition of consensus, how extensible is Habermas's public sphere in terms of its utility to preserve democratic discourse, especially when standard organizations all incorporate consensus models for their decision-making practices that are a driving force in technology? To answer this question, I propose to develop a model of the public sphere as depicted in various interpretations by authors who have evaluated current issues concerning Habermas's formulation.

Specifically, I will use Craig Calhoun's selection of essays on the topic, entitled *Habermas and the Public Sphere* (1992), which includes pieces by such theorists as Geoff Eley, Nancy Fraser, and Michael Schudson. As well, secondary sources such as Miriam Hansen's "Unstable Mixtures, Dilated Spheres: Negt and Kluge's *The Public Sphere And Experience*, Twenty Years Later" (1993) and Nicholas Garnham's "The Mass Media, Cultural Identity, and the Public Sphere in the Modern World" (1993) will supplement the notions of "counterpublics," "partial publics," and "multiple publics" brought forth in Calhoun's collection of essays. Lastly, Lyotard's dismissal of models of consensus in *La Condition postmoderne* (1979), Jameson's formulation of postmodernism (2001), and Rorty's reading (1991) of the debate between Lyotard and Habermas will provide ontological limits to Habermas's public sphere model. These works are major critical and genealogical critiques of Habermas's "progress narrative," which is embedded in the public sphere model in the form of "consensus." These critiques will help to focus a useful model of consensus in these times of the globalization of technology that is being used to create a post-industrial labour force.[1]

I will begin with the first theorization of the "public sphere" in Habermas's *Structural Transformation of the Public Sphere* (1962). His original theorization has a universalizing bias at its foundation, as Garnham points out in his critique (359). The original public sphere as defined by Habermas in his *Structural Transformation of the Public Sphere* (1972) is a space that "consisted of the realm of public assemblies, pubs and coffee houses, literary salons, and meeting halls where citizens gathered to discuss their common public affairs and to organize against arbitrary and oppressive forms of social and public authority" (Durham 10). However, newer formulations define the public sphere as including any democratically free and protected public common spaces where citizens are allowed to congregate, organize, and influence political happenings (10). This relatively new, historically defined space may ultimately be the goal of the Enlightenment social liberation and emancipation project; however, the question arises: is the Enlightenment social project the goal of the modern public or simply that of the intellectual elite as it is realized in social and political policy? To address this question, I will construct a contemporary model of the public sphere to compare with Habermas's original model. My last focus within this research will be to analyze Habermas's understanding of language as an inter-subjective indication of a "universal common denominator" within the public sphere that can help to explain why many democratic governments and organizations strive for consensus.[2] This foundation in language is often critiqued in Habermas's theory (Garnham 360; Lyotard 65; Rorty 85).

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[1] Chapter Four will provide detailed descriptions of the post-industrial labour force and the influence of the Canadian national government apparatus on the creation of the web. "Post-industrial" can be defined as a labour forced with its basis in "the centralising, standardising practices of a 'mechanical

Despite criticisms and reformulations of the public sphere, the inter-subjective notion of consensus is still found in the work of many neo-Structuralist theorists today (Leydesdorff, 2003; Roberts, 2001), especially in a variety of forms in the work of Humanities Computing scholars (Havholm, 1996; Simon, 1997; Winder, 2002). Consequently, I will provide current examples of public policy that highlight how the ideal of the public sphere is an entrenched political right within a democracy for which people are still working to improve. I will aim to clarify areas where Habermas's universalism is still being defended today. Loet Leydesdorff's "The Construction and Globalization of the Knowledge Base in Interhuman Communications Systems" (2003) and Gary Simon's "Conceptual Modeling versus Visual Modeling: A Technological Key to Building Consensus" (1997) will be used as example texts.[3] Overall, after describing and critiquing the two models of

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unit system' in the grip of an economy with planetary ambitions and totally lacking in concern for the 'soul of the species'" (Mattelart 45).

[2] "Universal common denominator" is used here to emphasize Habermas's belief that, as socio-linguistic creatures, human beings can all use language to resolve issues non-violently, and he believes consensus is the best model for resolving divergent issues (*Structural Transformation*, 2).

[3] Alasdair Roberts' article "The Informational Commons at Risk" (2001) will be a main source of Chapter Four's political economy analysis. As well, Robert Curran's "Rethinking the Media as a Public Sphere" offers a good analysis of the public sphere and how it is used in contemporary debates of the Canadian communication industry. Further, Hans Verstaeten's "The Media and the Transformation of the Public Sphere" offers a valuable literature review of Habermas's public sphere. However, I mention these sources as alternative points of reference to present day debates, and I will only focus on the articles directly addressed herein.

Habermas's public sphere, I will argue in this chapter that 1) contrary to a Structuralist and genealogical critique, not all forms of the progress narrative are inherently opposed to civil society; 2) Habermas's "public sphere" would definitely be a theoretical model that has a progress narrative embedded into its definition, and his model of the public sphere should be questioned for this reason; and 3) Habermas's "public sphere" is a needed concept for any civil society, or "public," to defend democratic principles. However, the public sphere is not the only model available from a hypermodern understanding, as will be discussed in relation to Lyotard's views of "dis-sensus."[4]

These arguments will help to delineate the boundaries of the public sphere in current policy studies. As Hansen describes, the public sphere is not a fluid entity that existed prior to the creation of the bourgeois class in the eighteenth century period (Hansen 186). Instead, the public sphere is a complex battleground of opinions that exists at the global, national, and regional levels of politics, media, and civil society. Each of the theorists in Calhoun's work, including Hansen, also describe the public sphere as an area of public life that must be identified, controlled, and allowed to flourish in order to protect the public good within a democratic governmental framework. This democratic space is important especially when corporate powers work to influence and limit it through lobbying, marketing, and consumer culture (Klein, 2003; Roberts, 2001). One means of defending the public sphere is to create policies that protect it. In many ways, I aim to provide a descriptive genealogical analysis of the "public sphere" in order to understand how it was constructed "originally" and how this will translate into technological artifacts like the Semantic Web. In Chapter Four, the information age will be a continued focus of public sphere debates as to how infrastructure needs and politics influence the basic requirements of the Internet and the Semantic Web. My hope is to help facilitate debate surrounding this fragile democratic space of public opinion, where its influence can develop and affect both the economic elite and governmental policy decisions.

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[4] Hypermodernism can be defined as the contemporary period of culture where the speed and delivery of information being affected by new technological powers are challenging nation states' sovereignty and power on the global market (Virilio, 2000; Graham, 2002).

II. Constructing a Model of the Public Sphere

> The standards of "reason" and the forms of the "law" to which the public wanted to subject domination and thereby change it in substance reveal their sociological meaning only in an analysis of the bourgeois public sphere itself, especially in the recognition of the fact that it was private people who related to each other in it as a public. (Habermas, *Structural Transformation*, 28)

The importance of private individuals using reason to form "standards" is the heart of Habermas's public sphere project. In his own words, Habermas describes the public sphere's development from a weakening centrality of authority: "Civil society came into existence as the corollary of a depersonalized state authority. Activities and dependencies hitherto relegated to the framework of the household economy emerged from this confinement into the public sphere" (*Structural Transformation,* 19). Specifically, Habermas's analysis of the public sphere begins by questioning the words "public" and "publicity." He focuses within his own German background on a single term that connotes both these English meanings: "öffentlichkeit" (2). He argues that a historical review of how *öffentlichkeit*'s multiple meanings have developed will inform a contemporary idea of how the word is used today.

Through this historical review, Habermas establishes that the medieval state did not have a public, as defined as a legally protected democratic space for free citizens, because the king was the only free citizen as recognized by law (7). However, with the rise of aristocratic capital, trade guilds, and renaissance humanism under the king's "representative publicity," a civil space began to develop. By the seventeenth century, mercantilist literature reflects the existence of this public sphere as a political space for the bourgeoisie (19). Habermas's *The Structural Transformation of the Public Sphere* also describes a major shift when the welfare state arises from liberal democracies with the protection of workers and their eventual unionization in Europe; during this time, the public sphere and the private sphere become separate entities where an individual had certain protected liberties, but could also own property, which also held certain protected rights (222).

For example, during the nineteenth century, publicity became a means of controlling the public sphere in the hands of the private sphere; this control led to the manufacturing and consumption of media messages (211). Newspapers that once played the role of disseminating political and socially organized ideas eventually became controlled by corporate media as advertising was a necessary means to offset production costs (Durham and Kellner 10). Habermas writes:

> Laws which obviously have come about under the "pressure of the street" can scarcely still be understood as arising from the consensus of the private individuals engaged in public discussion. They correspond in a more or less unconcealed manner to the compromise of conflicting private interests. Social organizations that deal with the state act in the political public sphere, whether through the agency of political parties or directly in connection with the public administration. (*The Public Sphere,* 107)

This process of creating the public civil society ironically led to the refeudalization of the public sphere, where large organizations use limited plebian support in an apparent display of openness to achieve their agendas. Refeudalization is defined as the process of aristocratic power returning to a dominant place in society, despite the formation of new laws to control the king's power; this process segregated society even further than during the feudal era. For example, people with newly acquired economic influence became members of the aristocracy and gained lands and power; this process of creating a new aristocracy is called refeudalization (107). Therefore, the public sphere is born at the same time that private individuals gained more legally recognized and protected powers.

Habermas's public sphere, in his understanding of the "Social Welfare State," is influenced by mass democracy and public opinion, after this period of refeudalization. Figure Six conveys (using my own model) Habermas's "original" public sphere as he described it in his 1962 doctoral dissertation (see Figure Six).

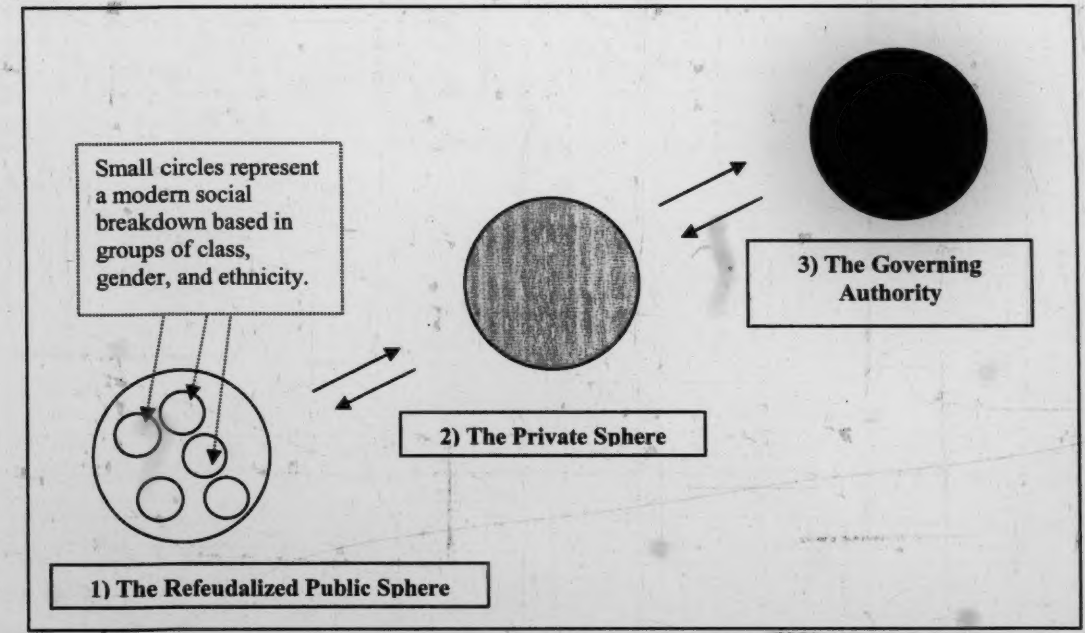
Small circles represent a modern social breakdown based in groups of class, gender, and ethnicity.
3) The Governing Authority
2) The Private Sphere
1) The Refeudalized Public Sphere

Figure Six:
A Model of Habermas's Public Sphere in a Social Welfare State Mass Democracy[5]

A quick interpretation of this model helps to identify Habermas's idealized notions of the public sphere. Rigid boundaries and multiple factions compose the contemporary public sphere, while a similar idealized separation between the private sphere and the governing authority remains.

A brief summary of Habermas's main critics highlights that the public sphere is still a highly contested space, as the main shifts Habermas describes do not form stabile, fixed modern boundaries under scrutiny. In fact, theorists such as Eley, Fraser, Granham, and Hansen, have been reformulating the public sphere in order to ensure its survival in the postmodern era. At present, the debate on the public sphere focuses on the following areas:

1. **Historical/Political Frameworks:** Many theorists attempt to identify how the public sphere exists in particular historical and political spaces (see Eley,

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[5] The "Private Sphere" and "Governing Authority" would all have similar smaller groups within their configurations as the "Public Sphere."

Fraser, Hansen, and Schudson). They also attempt to evaluate the limitations of these models.

2. **Critical Cultural Frameworks:** Creating new spaces within the public sphere for particular social movements, using newer approaches such as Gramscian studies in hegemony or other critiques such as postmodernism, are also common theoretical tasks (ie. Fraser questions the public sphere with a focus on gender issues, while Hansen raises the question of multiple publics).

3. **Policy Examinations/Communications Perspectives:** Policy examinations of how the public sphere is constructed at present within the government and media bodies is a vital stream of inquiry (see Curran, Klein, Roberts, and Verstaeten).

I provide these three areas as a general review of the public sphere debate from Calhoun's collection of essays. Similar to this breakdown, Garnham's 1992 article, "The Media and the Public Sphere," also offers a general review of the literature. His review highlights the following criticisms of Habermas (359-360):

1. The neglect of the contemporary development of a plebian public sphere alongside the bourgeois public sphere.
2. The idealization of the public sphere's goal as an emancipation project.
3. The neglect of gender relations and the relations of production.
4. The neglect of pluralist structures due to Habermas's rationalist model.
5. The neglect of the possibility of public dissent and resistance in the public sphere and how these forms of public opinion affect the civil state (similar to Adorno's study of the cultural industries).
6. The neglect of other communicative actions that are not directed towards consensus.
7. All of these points combine to an overall critique that Habermas misformulates how information in the public sphere is linked with the roles of the mass media in constructing contemporary democracy.[6]

Despite his criticism, Garnham's article emphasizes three main virtues of Habermas's public sphere, which he believes should be protected in political practice for a democracy to exist. He writes that the main virtues of Habermas's project are that it

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[6] For another review of the literature, please see: Verstaeten, Hans. "The Media and the Transformation of the Public Sphere." *European Journal of Communication.* 11(3): Thousand Oaks, CA: Sage Publications, 1996: 347-370. This review also similarly highlights the emancipatory nature of Habermas's project.

1) "focuses upon the indissoluble link between the institutions and practices of mass public communication and the institutions and practices of democratic politics" (360); 2) its "focus on the necessary material resource base for any public sphere;" and lastly, 3) as he states, "Its third virtue is to escape from the simple dichotomy of free market versus state control that dominates so much thinking about media policy" (361). With these shortcomings and virtues in mind, I will use Garnham's ideas as a point from which to delve into a specific example of the public sphere's major critical limitations. Particularly, I will use Miriam Hansen's work to help develop a contemporary model of the public sphere. I will return to discussing the virtues of Habermas's model later when discussing Leydesdorff, Winder, and Simon.

Focusing on Hansen's analysis of the public sphere helps identify several new ideas within this debate through her interpretations of a new English translation of Negt and Kluge's *The Public Sphere and Experience* (1972). She writes of Negt and Kluge's early criticisms of Habermas:

> It is one of the major advantages of Negt and Kluge's approach that they recognize the irrevocably mediated and syncretistic quality of modern or postmodern publicity, whether dominant or oppositional. They do not stake their utopia of a proletarian public sphere on the model of face-to-face relations – even though they insist on the necessity of such relations for the ecology of human consciousness. But neither do they celebrate the global proliferations of electronic media in the spirit of McLuhan. (211)

As Hansen writes, Negt and Kluge were quick to identify that global proliferations of the public sphere were a consequence of new forms of capitalism. The main question that Negt and Kluge investigate in order to identify this consequence is: "What determines which theories enter the field of intellectual discourse, as a specialized public sphere within a larger field of cultural 'publicity?' " (179). In her introduction, Hansen points out that there are generally three areas of contestation in cultural publicity: (1) gender and sexuality, (2) race and ethnicity, and (3) representation and reception (181). She considers these points in relation to Negt and Kluge's ideas through both historical and popular examples.[7] By presenting popular examples, she argues that media and cultural changes continually reframe the boundary of the public sphere as new groups and voices become identified as sources of power within it.

After this general introduction, Hansen's article is broken down into two sections: (I) "The Seventies: Decade of Disjunction," the time period from which Negt and Kluge's work arises; and (II) "Questions for the Nineties" that discusses how their work is influential today. Section I is a longer consideration of "experience," while Section II details Negt and Kluge's idea of a proletarian public sphere. Similar to Habermas's framework of investigation, Negt and Kluge begin by analyzing the words "public" and "publicity," which leads them to an oppositional formulation: "the counterpublic" (*Gegenöffenlichkeit*). Hansen argues that the counterpublic was such a powerful buzzword during the German seventies because "it linked the notion of a critical and oppositional public sphere with another keyword of the decade – '*Erfahrung*' (experience)" (186). This definition of counterpublic was oppositional because experience is defined differently in the German case as "… a sense of mobility, of journeying, of wandering or cruising…" (187). This idea of experience also provides a different meaning for the term "public":

> … it implies to a spatial concept, the social sites or arenas where meanings are articulated, distributed, and negotiated, as well as the collective body

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[7] For example, she describes how Magic Johnson's media experience as an African American who is HIV positive is one instance of ethnicity affecting the public sphere through publicity in the media. In other examples, she uses the actions of popular music groups to support her analysis.

> constituted by and in its process, "the public." But *Öffentlichkeit* also denotes an ideational substance or criterion – "glasnost" or openness… (179)

Negt and Kluge focus on this oppositional definition of the public because they hope to offer an alternative definition of the public sphere that can defend against the neoconservative "…attempts to restore an ostensibly value-free hierarchy of cultural values (that never existed to begin with)" (183). This link of the public sphere and "Erfahrung" to create a counterpublic allowed for a new kind of thinking in terms of a "proletarian public sphere" (208), which anachronistically nods towards the Marxist tradition that Negt and Kluge support.

Hansen believes this conception of a "proletarian public sphere" offers an empowering neo-Marxist critique to this debate. She writes that "It is a category of negation in both a critical and a utopian sense, referring to the fragmentation of human labour and existence and its dialectical opposite, the practical negation of existing conditions in their totality" (202). To unpack this statement, it is important to highlight that dialectics is a tool of logic that helps to order critical arguments as: (1) Thesis/Position, (2) Antithesis/Negation, and (3) Synthesis/Balance. In other words, Hansen is arguing that (1) the thesis of a "public" offset by (2) the antithesis of a "counterpublic" provides (3) a balance or new synthesis for debates about the public sphere because such a new position helps to foreground issues like labour or class polemics (Hansen 202; *The Structural Transformation of the Public Sphere,* Chapter 14). Overall, Hansen's understanding of Negt and Kluge describes an area of resistance for marginalized groups in the counterpublic.

Interestingly, Negt and Kluge's alternate formulation of a Marxian reading of Habermas sounds strikingly similar to Nancy Fraser's description of multiple publics in her article “Rethinking the Public Sphere” (1992). However, Hansen notes that Negt and Kluge only pursue plural or multiple public spheres in a limited way. They suggest that alternate public spheres exist in the “public sphere of children” or a “female productive force” (186). However, they do not address “multiple public spheres” in a definitive way, as does Fraser (Fraser 121), nor do they use similar readings of a Gramscian critique that uses such terms as “hegemonic forces” or “subaltern classes” (Hansen 201) as Hansen does.

A model can now be constructed of what a contemporary public sphere might look like. Figure Seven is an attempt to visualize the spatial bodies that surround and influence the public sphere in light of arguments made by Fraser, Garnham, and Hansen (see below).

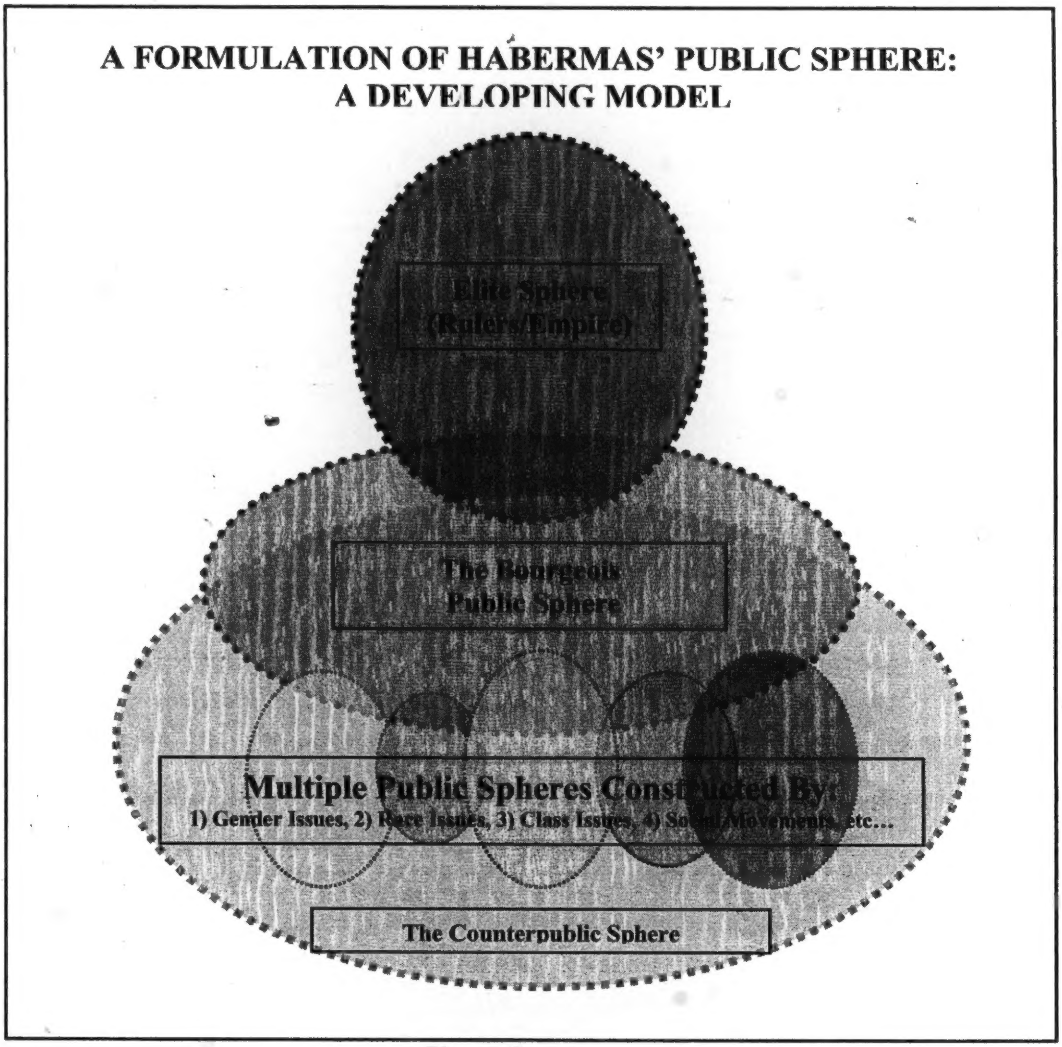
A FORMULATION OF HABERMAS' PUBLIC SPHERE:
A DEVELOPING MODEL
Elite Sphere
(Rulers/Empire)
The Bourgeois
Public Sphere
Multiple Public Spheres Constructed By:
1) Gender Issues, 2) Race Issues, 3) Class Issues, 4) Social Movements, etc...
The Counterpublic Sphere

Figure Seven:
A Formulation of Habermas's Public Sphere - A Developing Model[8]

Figure Seven helps to visualize how the permeable borders and cross-influential public spheres might be ordered in a hierarchy of authoritative political spaces for a civil society based on the reformulations provided by Fraser, Hansen, and Garnham. In this model, the nature of the multiple publics can be presupposed to exist in all spheres of influence, but there will always be dominant spheres at each level because consensus is an unstable, fluid entity that depends on time, place, and experience, as Hansen describes. With this general model and review of the literature in mind, I will now focus on a central debate at the heart of Habermas's public sphere in order to clarify its foundations.

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[8] The public sphere is *not* directly a part of the governmental sphere or apparatus, which will be described in Chapter Four. Instead, the laws of the state apparatus or texts of the media apparatus can be seen as representations of the public sphere for any particular society or culture. However, the "elite sphere" and the "bourgeois public sphere" as presented in Figure Seven are distinct reflections that all parts of society have a public face, whether directly political or less stably bound to the state apparatus. Each sphere can also change or negotiate ways in and out of the other spheres (for example, people can change their position of influence through economic fluctuations caused by such things as disability, educational training, or inheritance).

III. The Public Sphere Today

> … I want to raise the question, central to Habermas's project, of the validation of the Enlightenment project. Habermas has sought an ontological validation in universal pragmatics. This approach has been widely and, in my view, correctly criticized on linguistic grounds. But I do not believe that such a grounding is necessary. For me, the grounding can only be in history itself. That is, the evidence for the possibility of the Enlightenment project is that large numbers of human beings from different cultures have actually believed in it and fought to realize it. Only history will show whether the project is in fact real realizable. (Garnham 374)

As Garnham points out, major debates have arisen concerning Habermas's notion of universal pragmatics at the foundation of the public sphere, and how universal pragmatics tend to make the public sphere into an idealized space for political control (Garnham 360). As described above, Habermas believes that language is a universal common dominator when it comes to political social debate because fundamentally every human being must communicate to reach any form of consensus. Garnham's criticism of this practical ideal is that unfortunately there exist fundamentally different languages that cannot speak to one another (ie. Christian Fundamentalism versus Islamic Fundamentalism; George W. Bush versus Saddam Hussein); however, it is difficult to decide whether this shortcoming is a flaw of Habermas's original formulation.

Despite such criticisms of Habermas, it is easy to find that the Enlightenment project is still a basis of many theories and texts today. Such is the case in Loet Leydesdorff's work, where a revitalized notion of Habermas's Enlightenment project is evident. He writes:

> Social order, however, consists of expectations being exchanged among individuals realizing their life cycles in interaction with the contingencies of their biological bodies. Within the life cycle of an individual certain problems have to be solved: real-life conditions place constraints on the differentiation between possible meanings and the distribution of events. (Leydesdorff 281)

Leydesdorff argues that higher-order cultivations of language bound by systematic theories must be used to create a global knowledge base. This type of systematic ordering can only be facilitated through language and consensus-driven projects.

Other versions of this argument can be found similarly in Humanities Computing literature. In Simon's "Conceptual Modeling versus Visual Modeling: A Technological Key to Building Consensus" (1997), he argues that the Text Encoding Initiative (TEI) and Standard Generalized Markup Language (SGML) can be used to generate consensus among scholars. Similarly, as was noted earlier, Winder argues that Structuralist ideals are keys for new Humanities Computing projects such as La Sociéte d'Analyse de la Topique Romanesque (SATOR). SATOR scholars attempt to code topoi, or "narrative blocks that are repeated in different texts" (304), in order to construct a dictionary of topoi. An example of topoi would be the "Dear John Letter" or the "misplaced letter" (304); however, SATOR has created very complex topoi beyond these simple examples, which include broad descriptive, discursive, and narrative categories.

Winder argues that the SATOR demonstrates the Structuralist ideal of consensus in that structuralism "is a general intellectual framework that harmonises the expertise of the researchers involved" (304). Notably, he believes this use of Structuralism fills a void in Humanities Computing scholarship, where structuralism's many factions were previously difficult to encapsulate into digital applications because of structuralism's dispersion into post-structuralist formulations (300). Winder identifies the WinBrill Part-of-Speech (POS) tagger and interpretative semantics as two forms of neo-structuralism in electronic scholarship that provide foundations for SATOR's work. He also believes that these types of "textual scholars will no doubt find themselves working side by side with commercial groups" (305) in the new textual analysis archive culture. In his view, commercial applications of this technology are important because they provide a way for Humanities scholars to gain support for their work and develop paths that affect communities outside of academia.

From a Social Theory tradition such as Mattelart's work and a reformulated genealogical analysis perspective, how can a Humanities Computing perspective reconcile a "progress narrative" such as the one embedded in Habermas's work with post-structural or postmodern criticism? As in Garnham's criticism of Habermas, the effacement of multiple "values" and "voices" becomes a necessary part of new Humanities Computing work. Simon admits such problems with SGML projects, when he writes, "often there are different points of view (whether due to differences in perspective, area of focus, terminology, or notation) that make it difficult to achieve such consensus" (305). Correspondingly, in developing the XML-driven Semantic Web, a concern is how the progress narrative and the problem of erasing or effacing multiple voices might be avoided. A study of the major debate between Habermas and Lyotard might best be able to provide resolution to such issues as the material limitations of consensus and the effacement of marginalized groups through the use of the progress narrative; that is, of course, if such any resolution is possible.

IV. Lyotard and Jameson's Postmodernism

> Lyotard's position ran counter to the thesis of the German philosopher Jürgen Habermas, who maintained that in a society guided by an ideology of technology and science, the criterion for the validation of knowledge can only lie in the principle of consensus: the players must agree on the rules of the game and consensus is reached through dialogue between individuals as intelligent, knowing beings with free will. For Lyotard, legitimacy is achieved by dis-sensus: an information system will be legitimized only if it gives rise to the invention of new 'moves' in already existing games, or to new games. What needs to be done is to determine which criteria of judgement and legitimacy have 'local' value. (Mattelart 96)

Mattelart's work summarizes the major debate that waged between the two intellectual giants Habermas and Lyotard in the 1980s. In *La Condition postmoderne* (1979), Lyotard argues that dis-sensus is the marker of how legitimacy is achieved in certain power games, where "an Other" must be present to legitimize a dominant elite and dis-sensus becomes representative of the battlefront of these two clashing forces (Lyotard 61; Jameson, 1984). However, it is generally agreed that this debate between Habermas and Lyotard is far from resolved (Rorty 85). I will use the characterization of Habermas's work above and Richard Rorty's "Habermas and Lyotard on Postmodernity" (1991) to suggest that Lyotard's postmodern project has been co-opted by the forces of global hypermodern culture, which theorists such as

Graham (2002), Latour (1993), Jordan (2002), Pfohl (1992) and Virilio (2000) describe. In other words, postmodernism, which once defined the limit of modernism's linear logic, has become another intellectual maneuver or survival tactic in a hypermodern world; this is a world where people live either on the edge of apocalypse that postmodernity predicts or beyond such theorizations of an imminent day's end in an ever-nearing utopian techno-paradise.

Lyotard's *La Condition postmoderne* (1979) calls for a questioning of Western society's political and economic connections between Darwinian versions of scientific reductionism and materialist, neo-liberal ideology. He writes that postmodern discourse and his formulation of dis-sensus "destroys a belief that underlies Habermas's research, namely that humanity as a collective (universal) subject seeks its common emancipation through the regularization of the 'moves' permitted in all language games, and the legitimacy of any statement resides in its contribution to that emancipation" (Lyotard 66, qtd. in Rorty 85). In other words, Lyotard believes that consensus, as a model for emancipation, is not the best means for empowering individuals, because it "is never reached" (Lyotard 61). Similar to theorists such as Fraser and Hansen, he argues that modern forms of consensus efface or erase certain voices in Western political projects (65). Instead, he believes that dis-sensus best represents the many unique voices of marginalized peoples and that dis-sensus is instead the tool by which to empower pluralized social groups under a postmodern model.

In order to help clarify a definition of postmodernism, Jameson's later summary in "Postmodernism, or the Cultural Logic of Late Capitalism" (1984) will be used. The importance of Jameson's work is that he explains how postmodernism has come to be used as a term in such wide-ranging ways as 1) describing an aesthetic theory, 2) a form of critical thought, and 3) an historical epoch. He begins his characterization of postmodernism as follows:

> The first point to be made about the conception of periodization in dominance, therefore, is that even if all the constitutive features of postmodernism were identical and continuous with those of modernism – a position I feel to be demonstrably erroneous but which only an even lengthier analysis of modernism proper could dispel – the two phenomena would still remain utterly distinct in their meaning and social function, owing to the very different positioning of postmodernism in the economic system of late capital, and beyond that, to the transformation of the very sphere of culture in contemporary society. (553)

From this starting point, Jameson's elaborates on this paradigm shift from the modern period to that of a postmodern period by employing the analysis of aesthetics, economics, and politics. He explains how the present time period can be described differently from the one earlier in the twentieth century using ideas from Lyotard's work and Ernest Mandel's book *Late Capitalism* (552). His main example focuses on architecture and he even gives a nod to Toronto's Eaton Centre as a postmodern, fragmented space that is composed of multiple representational surfaces and constructed for the purpose of capitalistic endeavors (577). Due to the length of Jameson's essay, I have chosen to summarize his many arguments that define these two distinct aesthetic periods by constructing a comparative table to distinguish their contrasting characteristics (see Table Five):

Sections of Jameson's Text	**Modernism**	**Postmodernism**
The Rise of Aesthetic Populism	- Authoritarianism	- Aesthetic Populism ie. "Schlock and kitsch" (551)
Postmodernism as Cultural Dominant	- Hegemonic/Dominant Structures ie. Foucault's analysis of prisons	- Schizophrenic Structures/Intensities ie. Multinational Capital (554)
The Deconstruction of Expression	- Utopian compensation of the real - ie. Van Gogh's "Peasant Shoes" (555) - subjective feeling/affect	- External Surfaces linked with Commodity Fetishism - ie. Warhol's "Diamond Dust Shoes" (556) - "waning of affect" into euphoria and self-annihilation
The Postmodern and the Past	- Parody - "real history"	- Pastiche/Collage - Historicism
The Breakdown of the Signifying Chain	- Signification: Chain of meaning intact - Utopian scenarios - depth	- Split of signifier from the signified - ie. John Cage's music / "China" (569) - disjunction / hallucinogenic intensity / surface
The Hysterical Sublime	- Cities/nations as unified/singular	- Multinational fragmentation - networks (575)
Post-Modernism and the City	- Allegory/symbolism are uniform and consistent	- Hyperspace that constantly breaks down singular meaning
The Abolition of Critical Distance	- Temporality - autonomous spheres	- Spatiality dissolves - "Cognitive mapping" (586)

Table Five: A Comparison of Modernism and Postmodernism

By considering Table Five, Jameson's overall argument can be visualized as an aesthetic shift from uniform or singular modes of politics to a fractured, multinational system of politicized production. This shift has occurred because art has become inextricably bound into capitalism and this unification, taken along with the distinctions presented above, presents a change in contemporary society from its preceding modes of artistic creation and social organization. Jameson concludes that the "cognitive mapping" of these new political spaces, which arise in postmodern capitalism, is a possible alternative aesthetic maneuver that can aid in negotiating through these newly developing political and economic spaces (586). In other words, new forms of spatial theorizations and political dissension such as Lyotard describes will help control the contemporary information overload.

In a criticism of both postmodernity and Lyotard's understanding of Habermas's public sphere, Richard Rorty's "Habermas and Lyotard on Postmodernity" (1991) attempts to harmonize the many nuances and changing debates surrounding Habermas's notion of consensus and the public sphere. Rorty definitely favours Habermas's formulations of the public sphere; however, he tempers this formulation with Lyotard's criticism that dis-sensus is a useful tool for two separate groups of individuals to represent their particular needs. In a world of limited resources and growing populations, Rorty believes that incommensurable narratives and language games, as representative of particular institutions and apparatuses, must find some way to reach consensus in order to emancipate individuals, as well as to create non-violent resolutions. He writes:

> Lyotard unfortunately retains one of the left's silliest ideas—that escaping from such institutions is automatically a good thing, because it insures that one will not be "used" by the evil forces which have "co-opted" these institutions. Leftism of this sort necessarily devalues consensus and communication, for insofar as the intellectual remains able to talk to people outside the avant-garde he "compromises" himself. (95)

Instead of "dis-sensus" for the sake of the "avant-garde," Rorty advocates that legitimated and protected democratic consensus is a valuable and fragile ideal. He believes that it is far easier and more realistic to defend this ideal through Habermas's definition of consensus, than through some detached "sublime" artistic version such as Lyotard's postmodern definition. He writes:

> Social purposes are served, just as Habermas says, by finding beautiful ways of harmonizing interests, rather than sublime ways of detaching oneself from others' interests. The attempt of leftist intellectuals to pretend that the avant-garde is serving the wretched of the earth by fighting free of the merely beautiful is a hopeless attempt to make the special needs of the intellectual and the social needs of his community coincide. Such an attempt goes back to the Romantic period, when the urge to think the unthinkable, to grasp the

> unconditioned, to sail strange seas of thought alone, was mingled with enthusiasm for the French Revolution. (95)

In other words, Rorty argues that just because an idea is in artistic vogue does not mean that characterizations of that thought have higher merit or practical uses in real world politics, especially when only a limited avant-garde uses such a formulation in theory and not in action for the sake of "the wretched."[9] Ultimately, Rorty argues for a more robust definition of both "consensus" and "postmodernism." However, he is left lacking when defining a more complex criticism or alternative to the limitations of the Habermas's public sphere as presented above, other than to fall into a binary of the "sublimity" of postmodernism versus grounded rationalism (96).[10]

Shades of Rorty's argument can by found in current hypermodern literatures that attempt to answer such binary endings with more complex diagnoses. As previously described (see Methodology and Chapter One), I argue that "System Splicing" is a technique of hypermodern criticism that can help to differentiate between these modern, postmodern, and hypermodern criticisms. Pfohl's (1992) early characterization of hypermodernism in terms of "ultramodernism" describes how articulating and tracking "progress narratives" aids in developing a broader understanding of the contemporary neo-liberal formulations of consensus. He writes:

> ...linguistic rituals of representation are being rapidly transformed into cybernetically codified rites of "signing." This is indicative of a new form of social control: the close-circuiting of the inFORMational processes that seduce those they most consume out from within the thick-skinned experiential confines of modern subjectivity into a postmodern or quantum-like mechanics of sign-making itself. (8)

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[9] How "the wretched" are fairing in the new global techno-economy will be a focus of Chapter Four.

[10] Hypermodern critiques such as Armitage, Graham, and Jordan (2002), critique binary definitions of modernism, which will be developed in more detail below.

Pfohl identifies a "new form of social control" in his work, which others have taken up since. French theorist Paul Virilio's later work (1995; 2000) characterizes hypermodern culture, as distinct from modernism and postmodernism, based on the speed at which new practices of informational flows occur. He argues, "information is of value only if it is delivered fast; better still, that *speed is information itself!*" (*Art of the Motor,* 140). Other characterizations that set the hypermodern period apart from postmodernism and modernism include the production of surveillance as "sightless vision" (65), "mediated dependence" in electronic prostheses (65), and the collapsing of space (151).

In other words, hypermodernism is directly connected to changes in how information is delivered, and the Semantic Web is a medium that is exemplary of this hypercultural era. In a hypermodern era composed of information overload, light-speed time expectations, and limited resources, I believe that "systems splicing" as a survival tactic is better able, than Rorty's binary model, to critique the dispute between modernism and postmodernism, or consensus and dis-sensus. Where modernism argues for fixed disciplinary systems and postmodernism argues for fragmented structures, hypermodern theory views both of these aesthetic systems as valid. This view develops because hypermodern theorists advocate that the multiple systems of modern culture, language, economics, politics, and technology, to name a few, are not being dissolved completely by postmodern critiques.

Instead, in an age of light-speed computer communication, dominant powers influence, negotiate, and control all of these systems in a web or network of power. As well, everyday subjects are expected to survive through the negotiation of these apparatuses, structures, and the informational flows that represent these structures are completely different from pre-modern and pre-industrial labour. For these reasons, the progress narrative is a representative flow of power that reduces these many complex systems into a singular, linear narrative of power. "System Splicing" like the survival tactics of the late 80s TV show character *MacGyver* or those of explorers, militants, soldiers, and even terrorists, who survive using whatever means are available, might be a bare minimum for intellectuals today. Harold Innis wrote in his famous "Plea for Time" (1951) an early forewarning of the dwindling funds and support for Humanities education, which governments are creating as the demands of the labour market change. This lack of Humanities funding is a sign that people are ignoring the long view of research into how human beings can survive and live together in alternative ways to that of a neo-liberal order.[11] As Naomi Klein points out in *No Logo* (2003), many postmodern theories have been co-opted into practice by the dominant capitalist system, which has happened similarly with most other academic theoretical systems. In such a co-opting, postmodernism is in fact another hypermodern system of production.

So, how can the model of the public sphere described above be based in modern consensus and incorporated into a technology such as the Semantic Web without a questioning of the progress narrative embedded in its economic, military, and political aspects -- especially when such technology may reduce multiple voices into a standardized method of describing and organizing electronic texts? The answer may be that each voice in society will have to create its own standard for describing documents or else use the dominant codes of consensus as Rorty describes. However, in a more complex view tempered by the reformulations of Habermas's work and hypermodern theory, I believe that both consensus and dis-sensus are just two modern survival tactics among others, such as deconstructionism, expressionism, impressionism, or post-structuralism. The many, varying maneuvers available for survival should not be privileged by one narrative or another. To privilege one narrative over another would be to limit these survival tactics under a monolithic narrative and monopolistic state, which does not effectively represent the complex system of our existence. As will be argued in Chapter Four, a political economy understanding of the Semantic Web is required based on these findings. Further, an understanding of how these flows affect the discipline of Humanities Computing (see Chapter Five) will emphasize how many works by technological theorists like Castells's *The Power of Identity* (2004), Latour's *Politics of Nature* (2004), and Kroker's *The Will to Technology & the Culture of Nihilism* (2003), are turning towards ecological approaches in order to address this hypermodern situation and balance technological needs with the natural needs of human beings.

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[11] This argument will be taken up in Chapter Five. To note, I use genealogical tactics of disrupting linear logic in order to argue for a complex relationship beyond a linear progress model or narrative, which is consistent with the genealogical method; however, I believe Humans must be at the centre of the creation of meaning and emancipation, which is a separate idea taken from Humanities literature and Critical Theory that Structuralists and post-Structuralists generally do not support. In turn, I would argue that structural critiques are similar to scientific reductionist's arguments that ignore the inter-subjective nature of creating meaning. I believe that genealogical analysis can be resituated in the humanist movement, but such a reformulation is beyond the scope of this thesis.

Chapter Four
FLOW THREE - Political Economy and Technology

I. Informational Flow and its Infrastructure

> Information connotes the dual meaning of "bringing something into form" and of "forming something from within." Both are intended in our definition. Both imply a process. In Shannon and Weaver's (1949) original formulation, information is seen as the difference between two states of uncertainty after receipt or with knowledge of that message. The reduction of uncertainty is but a simple kind of "organizational work" that takes place in the mind of a receiver. Their theory turns out to be not powerful enough to explain the kind of information processes ongoing in society, even so, "making a difference" is the minimal evidence for organizational work.
> - Klaus Krippendorff (488)

Using Krippendorff's definition as a guide, this analysis of how Canadian policies are structuring the new political economy in the global Information and Communication Technology (ICT) era will provide a valuable understanding of why neo-liberal domination should be addressed in research on the Semantic Web. This definition of information is required for understandings of Semantic Web and XML initiatives because of the expensive infrastructure and governmental support that this technology requires. As Krippendorff describes, information connotes the dual meaning of "bringing something into form" and of "forming something from within," which sounds remarkably similar to the push and pull of consensus and dis-sensus in creating "organizational work." I will use Krippendorff's ideas to highlight how information trade and organization is fundamental to consensus from the perspectives of Communications Theory and Political Economy.

Communication Theory is concerned primarily with the social exchange and organization of information (Mosco 72). Broadly speaking, organizational works can be analyzed at several levels, including that of the national political economy level (or Federal government as socius), which will be the focus of this chapter's descriptive analysis of the Canadian ICT political economy and its changing resource base. Other levels include the global, the regional, and the municipal levels. Some attention will be paid to the global level in this analysis due to the major historical identification of Canada's national identity being dependent on communication technologies.[1] How this national identity has fostered the development of an ICT-based political economy will be analyzed, especially as many debate whether Canada as a nation is progressing positively into the global arena or is on the verge of its sovereignty being completely transformed into part of the American empire.[2] As in previous chapters, whether or not a global economy is "progress" will be analyzed using a genealogical approach.

To begin this examination of Canada's ICT infrastructure, I will use Vincent Mosco's ideas to foreground this discussion and provide a definition of political economy, before turning to Harold Innis' *Empire and Communication* (1950).[3] Innis presents an historical analysis of early Canadian political economy. He studies the development of paper, parchment, and the printing press; and describes how economics and capital investments shift to newer forms of technology for cost-saving measures from a staple-based economy (5). This theory of an industrial resource base is called "the staples thesis." Extrapolating from Innis' studies of the historical use of various technological media for communication and control within an empire, it is difficult to forecast what technological creations and diffusions might occur in the ICT industry; after all, the diffusion of technology is difficult to predict because of the many factors that influence a technologies uptake. For example, it took one hundred and fifty years to print and publish the first novel, *Don Quixote* (1604) by Cervantes, after the creation of Gutenberg's printing press (1452); however, it has taken only ten years for the HTML-based web to lead to the development of sophisticated web portals.

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[1] Harold Innis was among the first to document in this connection in his book *Empire and Communications* (1950).

[2] Particular support for the topic of Canada's developing ICT economy will be found in Robert Babe's "Convergence and the New Technologies," 1996; and Alasdair Roberts' "The Informational Commons at Risk", 2001.

[3] I will define "infrastructure" as broadly as possible in this chapter in order to understand how the US has classified technology as a "new national resource" (Mattelart 113). I designate "infrastructure" to include the structures and systems of energy production, distribution, and use, as well as the machines that use this energy. However, I will not include humans as a part of this system, as Mosco notes theorists like Murdock are likely to do, when he writes, "One can avoid both the idealism of the phantasm and the false materialism of the public sphere as a space to be defended *by defining the public as a set of social processes that carry out democracy...*" (170).

In such a broad perspective, one must be careful in making prescriptions about how the Internet and the Semantic Web will affect the Canadian political economy. However, when more narrowly defined, a comparative analysis of the contemporary period will help to raise major issues for ICT in Canada. An analysis of how Canada's economy has developed based primarily on staple natural resources will help to demonstrate a major shift in the political economy infrastructure, when compared to an analysis of the present political economic configuration of post-industrial, neo-liberal labour issues and politics. Among other definitions already suggested, the term "neo-liberalism" denotes "the theoretical and practical rejection of the active state that had emerged in the Keynesian post-war era, and its replacement by *laissez-faire* free-market doctrines and practices" (McBride and Shields 18). In this neo-liberal era, many theorists are arguing that technology is "a new resource" required to compete and survive on the global market (Mattelart 113). Through this examination of neo-liberal ideology in the Canadian ICT industry, I will argue that the following issue is raised: the new technological base requires a new definition and also requires public attention on how the general social good of the average citizen might be democratically protected through political policies in order to preserve and enrich the greater good of civil society.[4]

This analysis of Canadian ICT policy and Innis' bias of communication will help to identify that technology is used to determine how resources are allotted, and this form of resource control can lead to a major confusion. This confusion is whether or not technology is an infrastructure, a resource, a commodity, or even an agent with rights in an economy. As technological use is the primary means of controlling communication, distribution, manufacturing, and marketing; one might think that it is an infrastructure. Technology now composes and helps to control parts of the Canadian and American infrastructure, as well as its businesses, through the Internet, its applications, and its commodified content. This dependent structure is especially evident in a majority of service-based knowledge worker jobs within Canada. Through this economic dominance, technology has fundamentally come to affect every sector of the political economy so much that confusions are prevalent of how much technology is relied upon. Further, it may be that technology has replaced natural resources with artificial resources as the primary mode of the Canadian political economy, because the Internet is both a physical structure and an information sharing network. These basic structures are now required as the base for a global staples-driven economy, as many Critical and Cultural theorists have forewarned.[5] The question arises from such a repositioning of technology as a natural resource, "can humans really consume technological resources instead of natural ones to survive if we are already experiencing environmental problems and economic disparity?"

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[4] Alasdair Roberts' "The Informational Commons at Risk" (2001) will be a primary source of this policy analysis.

[5] Such theorists, beyond others listed already, include Jacques Ellul and his work, *The Technological Society* (1964), or Theodor Adorno and his work, *The Cultural Industry: Enlightenment as Mass*

Despite the Millennial bust of the "dot com" market (Chait, 2002), the market has rebounded. Canadians' experiences of being dependent on technology have become as Heidegger described: "enframed" in technology. The August 2003 power blackout on the Eastern seaboard is an example of how technology is the basis of the economic sector in Canada (to the tune of $7.1 million in Toronto alone).[6] This loss of electrical power and money obviously affected millions of lives on the Eastern Seaboard and had repercussions around the world, as people scrambled to adapt to the change of environment. Such a blackout would affect most Western nations similarly. In his early predictions of global technological issues, Innis argued that a technological balance must be found and maintained between technological dependency (eg. George Grant's theories) and technological humanism (eg. Marshall McLuhan's theories).[7]

To develop this thesis, I will first survey and then analyze Canada's current Information Technology and Communication (ICT) infrastructure through policy descriptions: specifically, documents composed by the Canadian Government (Information Highway Advisory Council [IHAC], "The Impact of the Information

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Deception (1993). However, as a limitation of this chapter Critical and Cultural theory will not be a primary focus.

[6] Toronto City Clerk. "Financial Impact of the August 14, 2003 Blackout." *Toronto City Council.* September 22nd, 2003 <http://www.city.toronto.on.ca/legdocs/2003/agendas/council/cc030922/pof9rpt/cl079.pdf>.

[7] As a limitation of this analysis, I will focus on Innis' work and not McLuhan or Grant's; however, these two terms of "technological dependency" and "humanism" will be defined later in this analysis. For more on Grant and McLuhan, please see: Kroker, Arthur. "Technology and the Canadian Mind: Innis/McLuhan/Grant." Montréal, Québec: New World Perspectives, 1984.

Highway on the Workplace," 1997; Senate of Canada, "Wired to Win? Canada's International Competitive Position in Communications, Interim Report," 1997). Support and analysis from Alasdair Roberts' "The Informational Commons at Risk," (2001), and Heather Menzies "Hype and the Information Highway," (1996), will aid these policy descriptions. Second, I will offer an analysis of how Innis understands the Canadian political economy. I hope to answer the question, "is the digital resource foundation both Canada's new 'staple' of the economy and basic medium of exchange?" when groups such as UNESCO have worked to reposition ICT as a "new national resource" (113). If so, then resources like the Semantic Web may become a new defense system, which could also be a lifeline for Canada's own people in future hypermodern wars of class and economy (Hardt and Negri, 2000; Virilio, 2000). Alternatives and solutions found in the work of Chomsky (1988) and Krippendorff (1993) will be surveyed in order to address how the Canadian political economy can react to changes in ICT and move forward in a global era.

II. A Survey of Canada's ICT Industry

> *The novelty of the new information infrastructure is the fact that it is embedded within and completely immanent to the new production processes.* At the pinnacle of contemporary production, information and communication are the very commodities produced; the network itself is the site of both production and circulation. (Hardt and Negri, 298)

Hardt and Negri's *Empire* (2000) describes the resituation of technology into a post-industrial place of importance. Like Innis before them, they contrast the use of roads as a network of disseminating power and information in the Roman Empire with newer means of circulation in contemporary imperialistic Empires.

They see the main difference between these two Empires as the use of "raw materials, markets, and labor power" (298), where now all of these things are controlled and deployed electronically.

A useful umbrella under which to critique the current post-industrial Canadian ICT polity can be found in Vincent Mosco's definition of "political economy." While formulating his own definition of "political economy," Mosco first describes various historical definitions of the term, which includes Williams' "intellectual description of a system of production, distribution, and exchange" and Gilpin's "branch of statecraft." Mosco defines political economy based on their ideas "as the study of *the social relations, particularly the power relations, that mutually constitute production, distribution, and consumption of resources*" (25). Mosco writes that, because of this broad definition, political economy is often informed by communication studies ("*communication is a social process of exchange whose product is the mark or embodiment of a social relationship*" 72), cultural studies ("Cultural studies is a broad-based intellectual movement which concentrates on the constitution of meaning in texts, defined broadly to include all forms of social communication" 247) and policy studies ("...the field is an amalgam of pluralist political and neoclassical economic approaches whose goal extends beyond explaining behavior to a normative interest that evaluates and recommends policy" 247).

In his analysis of political economy, Mosco also provides three broad categories for describing contemporary debates in the political economy area, influenced by communication studies: 1) Commodification, 2) Spatialization, and 3) Structuration. These debates can be summarized as follows:

1) **Commodification**: "… describes the way capitalism carries out its objective of accumulating capital" (140). In this chapter, Mosco describes how commodification has spread from the product market to labour markets and communication content. He reviews the major theories of Karl Marx, Adam Smith, Raymond Williams, and Georg Lukács, to name a few.

2) **Spatialization**: "… *the process of overcoming the constraints of space and time in social life*" (173). Mosco highlights Innis, Giddens, Harvey, and Castells as theorists who described this phenomenon. He also presents reviews of the major players in the multinational corporate system of spatialization of capital; noteworthy in this review is that in 1994, there was not a single Canadian company in the top twenty-five money earners for communications users (184). This fact will be returned to later.

3) **Structuration**: "… a *process by which structures are constituted out of human agency, even as they provide the very 'medium' of that constitution*" (214). How theories of social organization are structured, including those of social political thought, are important studies under Mosco's category of "structuration." Theorists in this category study such structures as social class (Chomsky, Williams), gender (Jansen, van Zoonen), race (Tabor, Gutiérrez), social movements (Haraway, McChesney), and hegemony (Gramsci).

While keeping in mind how Krippendorff defines information and how Mosco defines political economy, the ICT political economy of Canada will be critically analyzed from its original "staple-based" infrastructure and bias of communication, which Innis provides (Section III); what Mosco similarly calls "commodifciation" and "spatialization." As well, the "commodification" and "structuration" of ICT will be examined within the context of Canadian policy, which includes analysis of works by Roberts, Menzies, and Chomsky and Herman.

1) Commodification Supported by Canadian Government Policy

Prior to a discussion of Innis, a survey of government policy in the area of ICT and political economy will help to provide an understanding that Canada has a strong international-leadership foundation in the area of ICT. Summarily, the Canadian government has enthusiastically stated its support of ICT in the major institutional bodies of the Information Highway Advisory Committee (IHAC) and the Canadian Senate (IHAC, 1997). The precursor panel to IHAC announced its hope for "a seamless Canadian information and communications infrastructure… linked and integrated with the networks of our trading partners as part of a seamless, global information infrastructure" (Babe 283).

The Canadian Senate reported that there exist two sides to this digital debate that foregrounds the IHAC mission: the two camps are "digital optimists" and "digital skeptics," which is an intentional reference to that of the techno-humanists and techno-dependency theorists listed above. These positions were highlighted during a research trip to MIT:

> On one side, the "digital optimists" believe that new technologies, exemplified by the Internet, will transform society completely and ultimately lead to the elimination of nation states. On the other side, the "digital skeptics" take a more cautious approach and see change as more incremental, though they acknowledge that new technologies have altered the traditional constraints of time and distance. (Senate of Canada, 1997)

Implied in the two definitions are the concepts of globalization associated with "digital optimism" (ie. the techno-humanism of McLuhan) and the bias of communication that affects space and time (ie. Innis).[8] The Senate of Canada report also argues, in line with the skeptics, that Canada is in a dangerous position in relation to the United States' power monopolies -- even stating that "Microsoft, Intel,

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[8] These two terms of techno-humanism/optimism and techno-dependency will be discussed later in terms of Innis' views (Section III); or see: Kroker, Arthur. "Technology and the Canadian Mind: Innis/McLuhan/Grant." Montréal, Québec: New World Perspectives, 1984.

Cisco Systems, Netscape, IBM, Sun Microsystems, Newbridge and Corel have become the economic engine of the Information Age -- just as the railway and auto industries were the economic engines of previous eras" (Senate of Canada, 1997). Further, the report describes Intel as having "a market capitalization (i.e. share price multiplied by number of shares) valued higher than that of all three of the giant American auto makers put together -- General Motors, Ford, and Chrysler" (ibid). Despite the focus on commercial interests within the report, there is little focus on the protection of public and social interests.

This focus on commercial interests described within these two reports presents a contrasting lack of protection for the public cultural industries. The lack of protection is very worrisome because of the wide-range of disparity between the middle-class/lower-class public and the Canadian economic powerhouses. In Canada almost any list of the richest people shows that an amazing amount of capital is in the hands of married Anglophone males; with the Thomson ($14 billion U.S.), Irving ($6.2 billion U.S.), and Weston ($3.5 billion U.S.) families at the top of the list (Taris, 2003). As will be demonstrated through Innis' writings, wealth and power have always gone hand and hand historically; however, the kind of radical disparity in Canada (and the Western Hemisphere) listed above is something quite new. For example, the Thomson Corporation is the largest global provider of information solutions based in Canada with revenue of $7.5 billion (Canadian dollars) in 2002 alone (Thomson Corporation, 2003); compare that with Mosco's 1994 list of revenues for multinational companies (184), and one can see that revenues have skyrocketed.

However, the difference in today's political economy is not only the level of capital gains and revenue, but also the level of technological control, organization, and surveillance owned by the corporate powers. The question arises: is the freedom of the press and media within the democratic state, which is constitutionally protected for the public good, as free as some would hope? After all, does Canada not enjoy one of the largest middle class democracies on the planet or is the case that money and power do go hand in hand (ie. the current liberal "Sponsorship" scandal)?

Thus far, Canadian Governmental policy has highlighted major issues such as differences in opinion about Canada's technological infrastructure (the dichotomy of optimists versus skeptics) and problems for the Canadian public and cultural sovereignty because of nearness to the United States of America's monopolies. Other general areas of debate include globalization (see Fletcher and Everett, "The Media and Canadian Politics in an Era of Globalization," 2000; Hogarth, "Communication Policy in a Global Age: Regulation, Public Communication and the Post-National Project," 2000; McChesney "The Political Economy of Global Communication," 1998); the digital divide between rich countries and poor, as well as disparity within nations (Norris, *Digital Divide: Civil Engagement, Information Poverty and the Internet Worldwide*, 2001; Reddick, "Access and the Information Highway," 1999); and corporate convergence (Babe, "Convergence and the New Technologies," 1996; McChesney, "Media Convergence and Globalization," 2000). I only offer these articles as alternative sources for this debate and will not go into their intricacies in any great detail. However, I will focus on Babe's understanding of convergence that "summarizes the blurring of industry or sector boundaries in the communication field" (283) in order to highlight the influence of the economic elite on public policy.

2) Spatialization Arguments

Babe describes corporate convergence in terms of market capital and its technical integration of communication technology into "a single mode of transmission" in Canada (283). After describing how the three historically divergent industries of publishing, broadcasting, and telecommunications have been merged in recent corporate takeovers, Babe argues that this convergence is creating a powerful economic elite with a centralized role that aids in collapsing spatial distances. He argues that convergence is really about favoring the private sector, and not the public:

> Convergence and the information highway, like free trade, are about reapportioning power from government to business, from domestic to transnational enterprises, from labour to capital, from consumers and producers of public services to consumers and producers of private commodities. (303)

He further notes troubles for Canada's economy in general; in one particular instance, he estimates the loss of royalties for Canada between 1983-87 at approximately $1 billion per year in the converging international publication markets. Because of these losses, he states, "No wonder the U.S. withdrew from UNESCO when that body insisted that information be treated more as resource than as a commodity" (304). UNESCO is the United Nations Education, Scientific, and Cultural Organization; just one of many international standards bodies influencing the international ICT field. The UNESCO issue of confusing information as a resource with that of a commodity is a key problem in contemporary ICT political economy because a commodity is generally defined as an end product for trade and not a required resource for an industries' survival.[9] If one cannot be sure how a technology infrastructure is defined, then confusions will abound in the policies that governmental organizations are creating and how businesses and the public interpret these policies. As Mattelart and Virilio argue, the grey areas of law help to foster the interests of neo-liberal organizations who can further their own political agendas.

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[9] This confusion will be reviewed in my discussion of Innis. As well, a narrower review of spatialization literature will be offered when discussing Innis' "staples thesis" and "bias of communication" (Section III).

3) **Structuration**

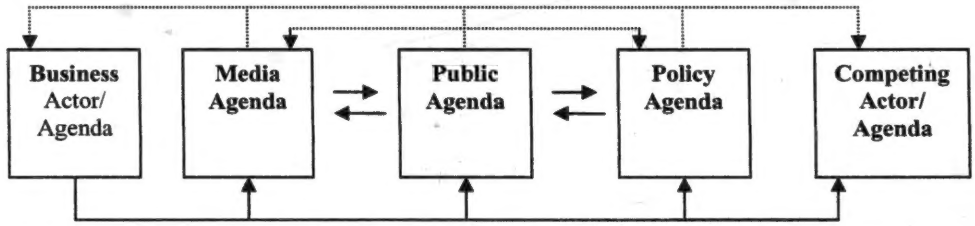
A major recent survey of business literatures in the *Communication Yearbook* (2002) provides a well-developed structural model for understanding how businesses affect the political policies of the ICT industry in general (most notably from a US perspective). In "The Political Role and Influence of Business Organizations: A Communication Perspective," Berger, Hertog, and Park explain that there are three ambiguous and fairly unexplored areas in this research:

> … (a) the communication strategies and tactics economic producers employ in the policy process, (b) whether or not their influence attempts produce "favorable" outcomes, and, if they do, (c) the circumstances or conditions most likely to yield such outcomes. (162)

I will use this invaluable review and framework to help organize my argument, alongside Mosco's framework. Berger, Hertog, and Park's review compiles more than 300 articles and books in order to summarize and create their general map of debates in this area. The reviewers document theories from Political Economy, Communication Studies, and Cultural Studies in order to understand the general issues of agenda-setting, contextual framing, and managerial influences of business practices on governmental policy. They state that "The role of communication in policy making is rarely examined. If one conceives of the legislative policy process as a form of social communication, as we do, this oversight is indeed troubling" (162).

Further, the reviewers argue that policy work should focus on multiple theoretical perspectives to illuminate and identify interest groups, collective action alternatives, public choice, transaction costs, exchange, resource dependency, institutions, agency, and firm behavioral theories as the main modes of understanding how businesses affect public policy. As well, they highlight that the "elitist view" (the view that elite powers control the government) has been the most consistent in understanding political policy decisions (164). Overall, a general model for understanding how businesses can affect public policy is constructed based on the work of Hall, Chomsky and Herman, and Williams, among others (169). Their model helps to visualize how the big businesses influences public policy (see Figure Eight).

A Model of Businesses Influencing Public Policy



Influence Goals	- Gain favorable publicity - Increase issue awareness - Frame Issue	- Affect public(s) opinion(s) - Mobilize supporters - Frame Issue	- Obtain favorable votes - Advance/block agenda items - Frame Issue	- Convince opponents - Reach compromise - Frame issue
Influence Techniques	- News Releases - Press Conferences - Staged Events - Interviews - Op-editorials	- Issue Ads - Publicity - Philanthropy - Internal change - Town hall meetings	- PACs, political support - Lobbying - Testimony, reports - Grassroots actions - Litigation	- Meetings - Co-optation - Internal Changes - Philanthropy -Litigation

Figure Eight: A Model of Businesses Influencing Public Policy (188)

A quick interpretation of Figure Eight provides an understanding that businesses have ready-made action plans for controlling public policy, which include litigation, lobbying, and influencing both the media and the public by direct means. With this review in mind, I have highlighted a few of the major theorists in the area of policy debates to provide examples of Canada's developing ICT "informational commons." The work of Alasdair Roberts (Section II.A), Heather Menzies (Section II.B), and Noam Chomsky and Edward Herman's (Section II.C) work help foreground Canada's political economy in terms of policy issues, which can be read as cultural documents that outline boundaries in this contested area of the public domain, or the "informational commons" as Roberts describes it --an area widely left unconsidered according to the above analysis.

(A) Policy Process in the Informational Commons: Communication Strategies/Tactics of Economic Producers

> In short, the informational commons is still contested terrain, and there is no assurance that its advocates will muster forces adequate to preserve its borders. Nevertheless, the struggle for an informational commons remains crucially important. Without the right of access to information, more basic human rights cannot be fulfilled.
>
> - Alasdair Roberts (192)

The informational commons, as described by Roberts, has been similarly described by other theorists during various time periods for differing reasons: Habermas' seventeenth-century "public sphere" is the site of debate for the newly arisen bourgeoisie-class of private owners (*The Structural Transformation of the Public Sphere*, 1972); Frederick Fletcher and Robert Everett's contemporary diagnosis of the Canadian media as a "public space" is a site of political contestation ("The Media and Canadian Politics in an Era of Globalization," 2000); in *No Logo* (2003), Naomi Klein calls for a "Global Commons;" and in ancient Greece "the agora" was a place of public debate for the citizens of the republic (that is, of course, for those who were not slaves). However, the term the "informational commons" helps to particularly denote the present time period of post-industrial economic structures in the global political era.

Roberts' formulation of the "informational commons" identifies the following boundaries of public discourse: "The territorial commons is paralleled by an ephemeral but equally important 'informational commons,' comprised of all the information that is accessible as a matter of right to all citizens" (175).[10] Further,

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[10] Roberts attributes the original metaphor of the informational commons to Yochai Benkler ("Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain." *New York University Law Review*. 74 [2]: May 1999).

Roberts separates the informational commons from the "public domain," which "... includes commonly held intangibles without which the commons or agora would be unusable. These include a sense of (1) shared identity and trust, as well as (2) norms and rituals that regulate collective deliberations" (175). In other words, Roberts is defining two separate spaces: one ephemeral and one directly influenced by human socialization, which is fairly daunting because these two spaces can generally account for *all forms of information.*

The question arises of how all information moves through space and whether or not it can even be controlled or protected by government policy: is the informational commons an ideal towards which the public is working or is this space an already existing entity in any democratic state? As will be noted later, Noam Chomsky argues that the forms of mediated information have filters controlled by the economic elite (Section II.C). Similarly, Roberts argues in his article "The Information Commons at Risk" (2001) that the present informational commons is a contested space struggled over by the political economic elite and the general public at both the national and supranational levels; "supranational" meaning "institutions [that] constitute an emerging system of global governance […] these institutions lack many of the structural features that have legitimized lower orders of government, including a comparable level of transparency" (183).

Roberts begins his argument for the protection of the public forum from supranational corporations by critiquing two pieces of conventional wisdom. The first is that "we are witnessing the emergence of a global informational society, in which new technologies will provide citizens with unprecedented access to information" and the second is "that the informational commons is broader than ever before" (175). In both cases, Roberts argues that these beliefs are in fact based on false assumptions. He summarizes his argument against these conventional ideas in three broad points (177):

1) "First, there is no evidence that new information technologies have altered the willingness of governments to improve transparency..."
2) "Second, technological advances have been offset by neo-liberal reforms that have reduced transparency, either by shifting power to private and supranational institutions, or by enabling corporate flight to jurisdictions with weaker disclosure requirements."
3) "Finally, the second-order effects of technological change have been neglected."

These "second-order effects" that Roberts mentions are found in the on-going societal reappraisals by the citizens, the government, and the private sector who all have disparate concerns of what information should be freely accessible (191). These concerns make up, and are evaluated throughout, the rest of Roberts' paper.

I have itemized some key decisions that have generally come into social consciousness in recent years using Roberts' work. Roberts' breaks his analysis into the following categories:

1) **Government Secrecy** (178 – 179): Freedom of Information (FOI) laws are being tightened in favor of the government and leaving loopholes for national defense as a primary reason not to release documents. He looks at cases in Britain, Canada, and the USA.
2) **FOI laws** (180-182): Governmental 're-structuring' and cutbacks worldwide do not allow for certain services (180), or else these services are being 'outsourced' to private partners who do not have to follow FOI laws.
3) **Reforming of Information Access** (182-184): "structural pluralism" allows for quasi-independent organizations that do not have to follow FOI laws.

4) **Supranational Governance** (182-184): NAFTA 1993, MAI 1995, WTO 1999; examples of international trade unions that are organized by appointed governmental representatives and not elected officials.
5) **New International Barriers** (184-185): IMF, EU; examples of international governance putting up smokescreens for information access.
6) **Corporate Control of Information** (185-186): Intellectual property (IP) rights, Napster, and Fair Use issues.
7) **Broadening Intellectual Privacy Rights** (186-188): Corporations are moving across national borders or out of state jurisdictions in order to save money.
8) **Hyper-Privacy** (188-190): Citizens are also afraid of personal information being improperly protected, which leads to further tightening on information access.

Roberts' arguments highlight the diminishing barrier between the national and international political arenas; as well, they highlights concerns for private/public rights to information access. I believe that Roberts' definitely has strong support for his case that the information commons is at risk. As presented previously, theorists such as Mattelart, Slack and Wise, and Virilio would agree with his prognosis.

Some of these risks that he identifies include the fact the G8 is not living up to its stated goal which stresses "improved access to information will 'strengthen democracy, increase transparency and accountability in governance, promote human rights, enhance cultural diversity, and foster international peace and stability' " (177).[11] His solution to these issues is an implied push for policies and lobbying that support universal access. However, one major issue that arises in his work is how his definition of an "ephemeral" information space, which offers very obscure boundaries, is different from the public domain in general. Despite both sites being contested spaces, Roberts is attempting to formulate policies that would help to provide protection of the general civil good in the public sphere and informational commons. As information was described by Krippendorff as an "organizational work," the technological version of the informational commons must indeed be a material entity. In other words, Roberts' work is necessary for protecting the political space; this is imperative especially when information is being viewed as a vital resource.

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[11] The G8 stands for the "Group of Eight" Western democratic political powers which form this economic and political organization. The nations of Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, and the United States of America, make up the G8.

(B) Do Corporate Attempts Produce "Favorable" Outcomes?

In the spirit of Roberts' arguments, I turn to Heather Menzies' work for a different definition of the Canadian Information Highway and to understand the effects that an economic elite can now have on government policy in contemporary times. Menzies writes:

> The Chrétien government has allocated over $100 million to CANARIE, a private/public-sector consortium dominated by industry, particularly telecommunications and business-service companies, to build both the multimedia information infrastructure and the equivalent of gas stations and other support services to go along with it. It has also opened its $6 billion infrastructure-renewal program to in-highway projects. On top of this, the federal government has been spending over $3 billion a year on information technology since 1990. (53)

Despite CANARIE existing as a private/public body, many business owners argue that there is a great amount of regionalism in receiving their contracts, with a disproportionate majority of 87% being distributed to Ontario or Quebec interests, despite it being a national organization (Industry Canada Workshop, 2001). Also, during the same time period, the United States' government spent only $2 billion a year for its "National Information Infrastructure Program," which is considerably less per capita than Canada's spending (Menzies 53). This is important to note because, as Menzies argues using Innis' ideas, Canada's national identity and political sovereignty are tied to the communications network that has developed across the country.

In her analysis of Canada's sovereignty issues, Menzies highlights a new trend in government practices: IHAC's newly forming relationship with private industry that has diminishing connections to the public domain. She writes:

> The federal government's Information Highway Advisory Council (IHAC) was dominated by big business interests—tele-communication carriers, manufacturers, and big-business users such as the banks—and its recommendations represented a major retreat from the traditional Canadian mixed private-public approach to communications—an approach that viewed communications as culture and community-building, not simply as a vehicle for the transmission of information products. (54)

Once again, like in Roberts' work, Menzies highlights a similar lack of support for the public sector. Because of this dependency on big business for ICT policy decisions, she argues using Innis' ideas that Canada's ICT industry is determining the new political economy. She writes:

> The information highway is becoming the medium of this new political economy, and its "message" or meaning lies in its structures and the new wraparound digital environment they create. As Innis first stated the proposition, structures of communication—here, the information highway—structure consciousness. They do this as the biases are built into them structure work, corporate organization, political, economic, and social relations, and culture. To an important degree they will influence and predetermine what we can and cannot do, what we can say, and what we desire. (58)

In many ways, the information highway has replaced the staple-based Canadian political economy, maybe an "über-staple" of *standing reserve* might be the term. Of course, it is now in the best interests of the dominant Canadian powers to retain their advanced position in this market using the political system as any staple-dependent industry has previously in the political economy. However, as was examined in both Roberts and Menzies' work, various levels of policy have developed that are no longer supporting the rights of the public domain/informational commons: 1) International: G8, NAFTA, NWICO, UN, UNESCO, WTO; and 2) National: CANARIE, IHAC, and NAFTA. The question arises, "How did the Canadian public and the ICT media get into this situation?"

(C) Media Structuration:
The Circumstances or Conditions Most Likely to Yield Such Outcomes

> Using a propaganda model, we would not only anticipate definitions of worth based on utility, and dichotomous attention based on the same criterion, we would also expect the news stories about worthy and unworthy victims (or enemy and friendly states) to differ in *quality*.
>
> - Chomsky and Herman (34)

Noam Chomsky and Edward Herman's *Manufacturing Consent* (1988) is often described as the first work to provide a unified vision of how media dominance is structured and controlled by an economic elite. Their propaganda model describes how media filters such as 1) ownership, 2) advertising dollars, 3) media sources, 4) flak, or "... negative responses to a media statement of program" (26), and 5) anticommunist ideology are the primary means in a democracy to control the media. Figure Nine below is a diagram of how these filters mediate the public's view of reality.

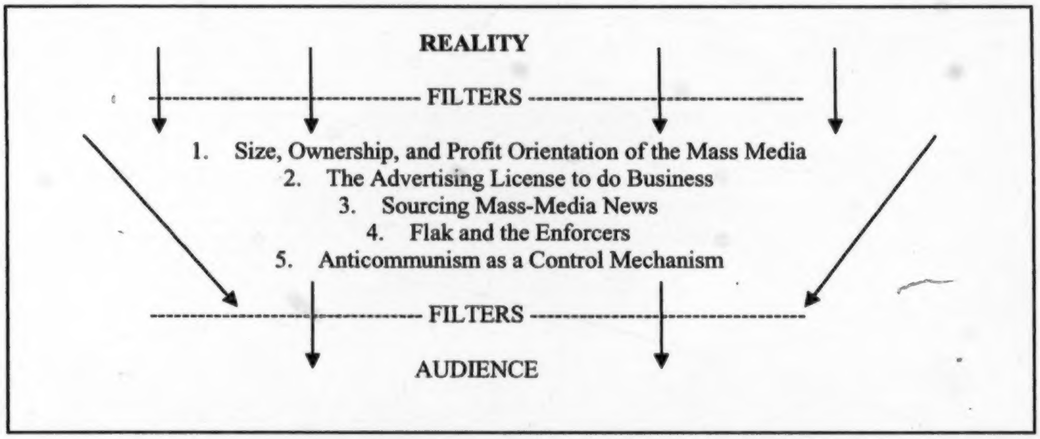
REALITY
FILTERS
1. Size, Ownership, and Profit Orientation of the Mass Media
2. The Advertising License to do Business
3. Sourcing Mass-Media News
4. Flak and the Enforcers
5. Anticommunism as a Control Mechanism
FILTERS
AUDIENCE

Figure Nine: Chomsky's Propaganda Model "Five Media Filters"

A quick interpretation of Figure Nine allows for an understanding that the information provided to the public is not directly representative of their best interests; notably, there is no reason to believe that these filters do not affect the ICT media industry similarly – with the one exception that it is cheaper and easier for anyone to create a web site (any one with access to a computer that is).[12] When this fact of media control is taken along with the powers that the technological infrastructure are providing the economic elite, then the hierarchy of historically defined dominance and the embedded, systemic problems of the bias of communication can be visualized. The bias of communication as described by Innis and Chomsky favours the dissemination of information by elite powers and not by the general public.

However, Chomsky and Herman do believe that resistance is possible (244). This is important to note because their view provides not only hope, but also guidance. Organized public bodies are their solution; these bodies are structured social movements that come to power and create agendas similar to the model that Berger, Hertog, and Park provide, but in this case these agendas are representative of the public and not business entities (Berger, Hertog, and Park 188). In other words, organized individuals can influence the areas of policy that both Roberts and Menzies highlight. At the moment, the Anti-globalization movement is still in the relatively early stage of development and is the only conceivable public body to influence the global stage (eg. the largest protest in the history against the Iraq war on Super Saturday or similarly the numerous WTO Protests). As will be demonstrated in Innis' work, such a global movement is needed to balance the historically dominant economic elite.

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[12] See these articles for sources of this argument: Norris, *Digital Divide: Civil Engagement, Information Poverty and the Internet Worldwide*, 2001; Reddick, "Access and the Information Highway," 1999.

III. Harold Adams Innis: Spatialization – How Did We Build this Space?

> The bias of modern civilization incidental to the newspaper and the radio will presume a perspective in consideration of civilizations dominated by other media. We can do little more than urge that we must be continually alert to the implications of this bias and perhaps hope that consideration of the implications of other media to various civilizations may enable us to see more clearly the bias of our own. (*The Bias of Communication,* 33)

Innis is often called the founder of Canadian communication theory for his groundbreaking work *The Bias of Communication* (1951). In this work, he builds off of his earlier critique of the Canadian political economy developed in *Empire and Communications* (1950). His studies of Canada's development as an international economic power as based on its industries that managed staple resources led to his formulation of the "bias of communication" and how each new industrial technological medium has an inherent bias. In one example, he turns to the media of papyrus, parchment, and paper to explicate "The effective government of large areas depends to a very important extent on the efficiency of communication" (*Empire and Communications* 7). He describes this bias as creating a reduction in space for the means of an empire's control and organization, which has been historically exemplified in Canada's race to create its nation-building communication infrastructure: the railroad, publication industries, telephone lines, public radio broadcasting, and cable networks. His conclusion to *Empire and Communications* foregrounds his future writing on the bias of communication. He writes:

> Concentration on a medium of communication implies a bias in the cultural development of the civilization concerned either towards an emphasis on space and political organization or towards an emphasis on time and religious organization. Introduction of a second medium tends to check the bias of the first and to create conditions suited to the growth of empire. [...] The instability involved in dependence on the newspaper in the United States and the Western world has facilitated an appeal to force as a possible stabilizing factor. The ability to develop a system of government in which the bias of communication can be checked and an appraisal of the significance of space and time can be reached remains a problem of empire and of the Western world. (170)

His final statements make clear that the informational commons, which is affected by the converging powers that use the bias of communication to great affect, developed historically. As well, Innis believes that a major problem for any government is how to best create and protect this public space. In the digital age of globalization, the solution seems to be through a networked communication economy.

Innis' critics often argue that his communication theory is based on a modernist version of technological determinism; the general idea that one's technology infrastructure determines all cultural, economic, political, and social arrangements (Stamps 124). Technological optimism is, alternatively, the view that the use of technology will empower humanity. However, Judith Stamps believes that Innis' ideas are a fusion of a critical political economy approach and the cultural criticisms of the Frankfurt school. The combination of these two approaches creates a uniquely Canadian type of criticism, which is entirely of Innis' making. She states:

> Harold Innis and Marshall Mcluhan were Canadian theorists of modernity who challenged the boundaries of Western epistemology through a self-styled, uniquely materialist analysis of communications media. Their work is best seen as part of a larger Western project of rethinking the cultural dimensions of space-time relations by employing models built around the temporal qualities of sound. Like Theodor Adorno and Walter Benjamin, the Frankfurt School theorists with whom I am comparing them, they carried out this task by developing a method that retrieved a fluid, personal sense of time by redefining the oral/aural medium of dialogue. (151)

In other words, Stamps believes that it is not technological determinism guiding Innis' argument, because he adopts a more complex view of communications and culture, separate from, yet similar to the Frankfurt school. She argues, instead, that Innis' study of the margins and the centre helps to develop a complex understanding of communications and political economy by defining the staple versus the commodity as the basis to political economy. She writes:

> Instead of commodities – those featureless characters that bowed endlessly to the laws of supply and demand – he saw the staple, and the staple, an unprocessed material, either grown (as in wheat) or extracted (as in fish), whose very structure set the boundaries for the institutions needed to appropriate it. He saw, instead of the happy road to global integration, a vortex – an industrial core with a spatializing momentum that drove it constantly to exploit its surroundings as sources of staples and marginal outlets for its own factories. (Stamps 56)

In other words, Innis' concept of spatialization provided a basis on which to form the hypermodern critique of political economy and global flows that Menzies and Roberts' works support. These definitions of the breakdown of space and the staples thesis of political economy help to establish Innis as a required background to this debate. However, the debate of how to create public policy to protect Canadians, in terms of the social good, against the problems of global capitalism coupled with the technological dynamo, is difficult to address. This is especially the case when, as Menzies and Roberts argue, the forces are stacked against the public who no longer have direct access to or control of the previous staple resources, which they once helped to produce and refine. Even within governmental policy, there are confusions as to what exactly this new technological network will accomplish: is ICT an infrastructure, a resource, or even the newest driving replacement of the staple-driven neo-liberal economy?

Krippendorff writes in his analysis of ICT that computing is central to the future of all nations. He writes:

> It is fair to say that an *information society essentially creates its own possible futures and is limited primarily by the futures it can compute* and only secondarily by its material history. (517)

How will the new ICT political economy limit Canadians when major confusions are prevalent? Chomsky's media filters highlight that it is still the media giants that rule where previously upper-class, imperial elites had been the dominant influence on the Canadian government. Innis' staples-thesis of Canada's economic development once dictated the success of a political economy based in the trade of natural resources owned by imperial elites. Although wealthy families still own a majority of holdings in multinational corporations, it is now the case that national policies exist to control them (Babe, 1996; Roberts, 2001) – although these policies are contested in many areas, especially at the global/international level. The guidance and influence of these converging giants on policy have created the basis of the new hypermodern economy, which is a new form of both information trade and manipulated commodity trading that has perhaps even created a dependency as necessary as the natural raw resources.

Innis' "staples theory" is an invaluable contribution to the political economy debate for highlighting this issue of dependency. He adds not only a unique Canadian voice to the debate, but he also becomes a founding father in the area of communications studies for these contributions. Although by definition a staple is a natural resource, perhaps in light of how Innis defines the shifts within a staple-based economy, there should be a reformulation of what is a primary source of the economy when such a dependency exists. A reformulation should include the fact that a staple-based economy now requires an ICT-based infrastructure to compete on the international stage, as was described by Babe and Roberts, among others (Mattelart, 2003). With the knowledge that policy is currently being directed by big business, there must be develops in the area of the public domain and its extension in the "informational commons" in order for an Innisian balance between techno-dependency and unlimited techno-optimism to occur.

This reformulation of the staple based economy would provide a complex view of the creation of neo-liberal political economics and global power. This view is not one of progression, but one of dominance by an elite, which has been the same for all of history. Having now analyzed three separate progress narratives through the cultural and informational flows of three separate soci, I believe that the obvious acceptance of this narrative, when linked to such things as XML technologies, neo-liberal profit, or military secret code networks, is something that should be questioned based on the merits of Mattelart's critique that such a society does not favor the developing "global civil society" that is in its infancy (159). He writes:

> By having us believe that access via the Internet to 'universal knowledge', necessarily drawing on the monopolies of existing knowledge, can resolve not

> only the digital divide but also the social divide, the education experts of the large financial institutions such as the World Bank breathe new life into the diffusionist conception of development... (161)

In other words, the Semantic Web, global capital flows, and universal knowledge are not linked in a linear "evolution," "progression," or a "revolution." The progress narrative becomes a reason and structure by which globally dominating elites keep their power and keep the lower classes in place. Ultimately, Mattelart questions the bald face rhetoric that asks, "How can the flow of information be increased to better all mankind without impinging upon personal privacy, proprietary data, and national security" (113)?

The answer to this question is that many of these things are incommensurable, as Lyotard argues (see Chapter Three). If dis-sensus is the only means for consensus, then how might Humanities Computing fit into this equation? One direction might be to accept the objectivism and materialism of Computer Science and its reductionist tradition under the dictates of the progress narrative. Using Heidegger's ideas as a basis, Kittler argues that this path ends, as follows:

> Under the conditions of high technology, literature has nothing more to say. It ends in cryptograms that defy interpretation and only permit interpretation. (263)

Following a different direction, both the Humanities and literature will continue to have a great deal to say, just as the works of Deleuze, Foucault, Guattari, Hardt, Mattelart, Negri, and Virilio have spoken volumes thus far. Chapter Five will be a direct analysis of this issue of the Humanities tradition and how it should be potentially reformulated in the age of developing global ordering technologies like the Semantic Web.

Chapter Five
Reconsidering the Role of the Humanities

I. "Well, how did I get here?" – D. Byrne

> In ontological designing, we are doing more than asking what can be built. We are engaged in a philosophical discourse about the self -- about what we can do and what we can be. Tools are fundamental to action, and through our actions we generate the world. The transformation we are concerned with is not a technical one, but a continuing evolution of how we understand our surroundings and ourselves -- of how we continue becoming the beings that we are.
>
> - Terry Winograd and Fernando Flores (179)

Ontological design in both the Humanities and Sciences can generally be defined as a process of choosing what objects are in a rational universe of discourse and why those objects are necessary for functional communication or discourse practices. A model of the contemporary ontological framework for the Humanities will be the primary critical focus of this chapter. Deleuze and Guattari's ideas of the "socius" will be used in identifying this model. As an inscribing agent, what kind of socius are the Humanities? Are the Humanities a detrimental body without organs in Deleuze and Guattari's sense of the term "socius?" In other words, are the Humanities a social institution that is merely one more machine within the greater Empire-building machine of capitalism or can they be a source for resisting the politics of Empires? Overall, I believe that the various voices of Critical Theory, Cultural Studies, and Political Economy within the Humanities, which have been described through their three respective informational flows in this thesis, provide unique answers to such questions as those posed above.

In the present hypermodern context, the Humanities can generally be described under a qualitative model of investigation, which focuses on Human-based subjects. However, many Humanities scholars are now using new technologies, like the Semantic Web, to further their research using quantitative methods. In this chapter, the historical development of Humanism during the Renaissance, which eventually led to the creation of the Humanities and the Sciences, will provide a foundation for illustrating a new model of the Humanities.

After describing my use of the terms "Humanities" and "ontology" in a topical example of the current Iraqi war, some key literary examples of how Humanism's ontological model has changed from earlier formations will be surveyed using C.S. Lewis' *The Discarded Image* (1964) and Harry Levin's "The Modern Humanities in Historical Perspective" (1969). Next, I will look at Martin Heidegger's controversial "Letter on Humanism" (1947) to understand how Humanism has been perceived in the past fifty years. My aim is to offer a final model of the Humanities as a socius by describing its metaphysical and ontological framework, and how as a socius the Humanities can influence the creation of the Semantic Web. I believe that the groups of Sciences and Humanities scholars who influence the Semantic Web can be conversant and communicate via an interdisciplinary model. Such a model will help to explain how the interdisciplinary field of Humanities Computing has developed from the modern disciplinary academic system of the twentieth century (Rockwell, 1999; Sinclair and Gouglas, 2003).

II. Defining the "Humanities" and "Ontology"

> The term 'humanities' includes, but is not limited to, the study of the following: languages, both modern and classic; linguistics; literature; history; jurisprudence; philosophy; archaeology; the history, criticism, theory and practice of the arts; and those aspects of the social sciences which have humanistic content and employ humanistic methods. (qtd. in Levin 6)

This general definition of the Humanities is taken from the U.S. National Endowment for the Humanities. The specific subject areas listed in this definition limit the ontological bounds of study of the "Humanities." Without getting into an abstract philosophical definition of "ontology" just yet, an important point to remember is that interested Information and Communication Technology (ICT) social groups are currently creating standards that assert both theoretically and practically what objects exist in a digital environment; Terry Winograd and Florence Flores call this "ontological designing." Ontological designing is important because Humanities-based technology initiatives such as the Text Encoding Initiative (TEI) or the Oxford Text Archive (OTA), which are two of many example organizations, will be governed by what standards are created.[1]

Historically, ontology has held a different meaning in the Humanities. The *On-line Philosophy of Mind Dictionary* defines the terms "ontology" and "metaphysics" as being very closely related. These two terms are defined as follows:

> Although the two terms "ontology" and "metaphysics" are far from being univocal and determinate in philosophical jargon, an important distinction seems often enough to be marked by them. What we may call ontology is the attempt to say what entities exist. Metaphysics, by contrast, is the attempt to say, of those entities, what they are. In effect, one's ontology is one's list of

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[1] See Chapter One for the MetaMap of the many organizations involved in influencing the creation of the Semantic Web: Turner, James. *The MetaMap*. 2003 <http://mapageweb.umontreal.ca/turner/meta/english/metamap.html>.

> entities, while one's metaphysics is an explanatory theory about the nature of those entities.[2]

In other words, "ontology" is the list of things in creation and "metaphysics" is a theory that attempts to explain why those things exist. Using these traditional definitions of these terms, I will turn to a description of an ontological model of early Humanism as a general site for preserving the qualitative knowledge heritage of humanity using those terms as a basis, before describing how the definitions of these terms have changed over time.

The library of Alexandria that developed under Ptolemy is legendary for being among the first documented libraries in the world. The library was created at the centre of ancient trade routes, and it is one example of the earliest foundations of the Humanities. In the terms of the humanistic value for preservation of scholarly materials, it is important to remember why the library was burned down several times throughout history. The burning of this library is uncertainly described as having occurred at three distinct periods in history by one of three individuals: 1) Julius Caesar in 45 BC; 2) Theophilus, the Patriarch of Alexandria in 391 AD; and 3) Caliph Omar in 640 AD.[3] The following table provides a brief sketch of why these individuals were identified as instrumental in burning down the library (see Table Six below).

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[2] "Ontology." *The Dictionary Philosophy of the Mind.* May 2003 <http://www.artsci.wustl.edu/~philos/MindDict/dictindex.html>.

[3] Chesser, Preston. "The Burning of the Library of Alexandria." *eHistory.com.* June 1, 2003 <http://www.ehistory.com/world/articles/ArticleView.cfm?AID=9>.

1. Julius Caesar	Caesar orders the burning of his fleet in the Alexandrian harbor in an attempt to defeat Pompey. The city and library catch fire.
2. Theophilus	Theophilus converts part of the library into a Christian church and destroys documents in the process. Other riots connected to the death of the Head Librarian Hypatia during the time may have caused further damage.
3. Caliph Omar	After conquering the city, Omar orders the library destroyed, saying that the scrolls will either contradict the Koran, in which case they are heresy, or they will agree with it, so they are superfluous.

Table Six: Contested Destructions of the Alexandria Library

What is significant to note about the destruction of cultural objects in the world is that these lost objects affect the ontology that can be developed and how a territorial socius can be defined. Specifically, items that are lost cannot provide evidence for justifying the classification of objects within a list of existing objects, and such a loss has traditionally been against the deeply rooted values of humanists who have long argued over the preservation of objects versus access to cultural objects.[4]

Another example of this kind of cultural destruction of knowledge is the Turkish conquest noted by Alberto Manguel. Manguel writes:

> Like so many other invaders, the Turks attempted to destroy the culture of the peoples they conquered. In 1526, the soldiers of the Turkish army set fire to the Great Corvina Library, founded by Matthias Corvinus and said to be one of the jewels of the Hungarian crown. Almost three centuries later, in 1806, their descendants emulated them by burning the extraordinary Fatimid Library in Cairo, containing over 100,000 volumes dating back to the early Middle Ages.[5]

Manguel also documents various other reasons for cultural looting such as taking back stolen wealth, redistributing belongings of cultural heritage or, more simply, as acts of petty theft. These forms of the destruction and loss of information are the exact ends that many Humanists, most certainly librarians, wish to defend against, especially if historical information can allow for a more comprehensive ontological, or cultural, view of human identity. By the disciplinary design of the past one hundred years, the preservation of these objects has been a primarily Humanities-based objective.

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[4] Debates between the Humanists and the Scholastics are well documented; see Garth Kemerling's "The Origins of Scholasticism" (2002) for a historical analysis of this debate, or see Margaret Hedstrom's contemporary article "Digital Preservation: A Bomb for Digital Libraries" (1998) for how preservation is still a pressing issue today. Her work will be taken up below in more detail.

[5] Manguel, Alberto. "Libraries and their ashes." *A History of Reading*. Bloomsbury, March 1999: <http://www.oneworld.org/index_oc/299/hughesmanguel.html>.

As Margaret Hedstrom writes in "Digital Preservation: A Bomb for Digital Libraries" (1998), the issue of preservation is still relevant today for the Humanities. However, these issues have taken on a different quality in the digital age. Questions arise for digital preservation projects such as the following (189):

1. What materials should be preserved?
2. How much will it cost to preserve these materials or object?
3. Will digital preservation last longer than another preservation medium?
4. Who will have access to the real objects?
5. Who will have access to the digital representations of the object?
6. Who will maintain the overall archive, or library, and the digital archive?
7. Will a digital archive by interoperable with future systems?
8. Whose standards for organizing a digital archive or library will be used?
9. Where will the digital objects be stored?
10. How much information is too much information to describe these objects digitally?

Many of these questions have existed in some form for archivists and librarians over the ages. However, according to Hedstrom, the last question about how much information is too much to describe digitally has become a dominant issue when the amount of information affects the labour to develop and design an archive, the costs of storage space, and the maintenance of that space. In an attempt to find solutions to such questions as those posed above, Hedstrom develops three specific arguments. She states the following beliefs (201):

1. There is no one single solution to digital preservation. Each project requires a case-by-case study of what solutions will work best.
2. It is imperative that digital preservation technologies become affordable, ubiquitous, and easily accessible in order for democratic use of preserved materials to exist and to ensure that digital information survives.
3. It would be beneficial to both the preservation community and to those conducting research if there were more conversation about what information and uses of this information is shared in order to create standards.

Overall, Hedstrom's article provides a salient review of preservation issues.[6] Some of these issues can be addressed by new technologies such as the Semantic Web. However, the Semantic Web is not the only answer to these issues. As I have argued, Critical Theory, Cultural Studies, and Political Economy perspectives, which are also a part of the Humanities tradition, have valid questions about the nature and use of technology.

The current issue of the destruction of libraries in Iraq has been a sign of history repeating itself, similar to the examples and issues presented above. Embedded international correspondent Robert Fisk has documented the cultural disaster in Iraq. He writes:

> After international outrage at the failure of US troops to protect hospitals and the looting of the famous National Museum, Baghdad's National Library and Archives went up in flames yesterday. Almost all of the contents of the library are destroyed.[7]

The failure to protect human treasures of knowledge helps demonstrate the need for the Humanities to continue its research and preservation attempts. The Humanities might further such endeavors by using networked technologies, like the Semantic

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[6] Luciana Duranti's "The Long-Term Preservation of Authentic Electronic Records" (2001) provides similar arguments to Hedstrom's work, and I mention it here as an alternative source for issues of preservation.

[7] Lawler, Andrew. "Did U.S. Antiques Collectors Have Plans to Loot Iraq Themselves?" *Democracy Now!* Tuesday, April 15th, 2003: <http://www.democracynow.org/article.pl?sid=03/04/16/225210&mode=thread&tid=15>.

Web. However, as was noted earlier, unless an object is an electronic representation, the Semantic Web has its own limitations. These limitations include the fact that an electronic representation is no replacement for a real object. The neo-liberal ideology, which has been described as supporting dominant elites in the history of technological development, has generally ignored Humanistic pursuits in times of military exploits like the case in Iraq. Such shades of neo-liberal ideology have become a part of Humanities projects, as was argued earlier in the "progress narrative" accounts of Critical Theory, Cultural Studies, and Political Economy.

Therefore, the importance of identifying proto-forms of Cultural Studies as a Humanities discipline found in those practices of preservation described above are important to highlight because they provide an alternative history to that of a linear, progress metanarrative of the Humanities. Many histories identify the Renaissance as the beginning of Humanism; however, these prototypes of organizing knowledge, mentioned above, are evidence that the ancient libraries of Alexandria, Nineveh, Nippur, Pergamum, Qumran, or Rome actually fostered similar practices and values to present day institutions. Despite this long history, the Renaissance is generally designated as the period of Humanism's birth. During the Renaissance, human knowledge was freed from the superstitions of Christian domination that restricted access to archival materials. This strain of Humanism developed a completely new idea of ontology and a radically new model of being from the traditional definitions that I have described thus far.

III. The Development of Humanism and the Humanities

> This is the medieval synthesis itself, the whole organization of their theology, science, and history into a single, complex, harmonious mental Model of the Universe.
>
> - C.S. Lewis, *The Discarded Image* (11)

Lewis's work describes the medieval model of the Humanities, which is a model that still leaves its imprint on the Humanities today. In order to describe such a model, I have categorized three general definitions to summarize the historical development of Humanism and the Humanities based on Harry Levin's "The Modern Humanities in Historical Perspective" (1969).[8] These three definitions are as follows (6-8):

1. Humanism as the Renaissance revival of classic literature and its themes. A return of Greek and Roman pagan values with a concern for their preservation.
2. As above, Humanism as the academic study of literature, philosophy, and history, which is institutionalized in present day universities as the "Humanities."
3. Humanism as a short form of the nineteenth-century term "Humanitarianism," which is in various formulations attached to Christian values, naturalist values, or even atheistic values.

Levin works through these definitions of Humanism as a means to understanding why the Humanities should defend itself against the relatively new creation of the Sciences as an antonym to the Humanities. The Sciences are becoming a leading force in university educational systems, even though the scientific methodology is a different, not an opposite, way of pursuing human studies. I will offer Dante's work of anthropomorphized, Christian ideals in *The Divine Comedy* as an example Levin's first definition of Humanism.

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[8] There are many summaries of the different definitions of Humanism available, as well as timelines of important personages within the Humanities, which are more concise than what I will document herein. For a history of Humanism, please see: Klemens, Löffler. "Humanism." The Catholic Encyclopedia. Vol. 7. Robert Appleton Compay <http://newadvent.org/cathen/07538.htm>. For a historical timeline of Western philosophy and the development of Humanism please see: "Timeline of Western Philosophy." *The Internet Encyclopedia of Philosophy.* 2001 <http://www.utm.edu/research/iep/westtime.htm>.

One has to go back in history to Dante Alighieri's (1215-1321) work to begin the construction of historically based models of the Humanist movement. Dante's sublime vision is recorded in *The Divine Comedy* as a journey through the godly realms of Hell, Purgatory, and Heaven, in search of his famed love-interest Beatrice. In *The Divine Comedy*, Dante uses similar allegorical techniques to that of the Greeks and Romans, who narrativized their own divine cosmologies through the personification of their deities, like in the Homeric epics. These narrative techniques were considered extremely unique and controversial during Dante's lifetime because of the Christian resistance to the pagan ideals of the ancients. Because of his political views that were expressed within his writing, Dante was forced into exile from his home of Florence, during which time he wrote *The Divine Comedy.*[9]

In *The Divine Comedy*, Virgil (70-19 BC), the Roman poet, is Dante's guide through the first two divine realms of the *Inferno* and the *Purgatorio*, and Dante's muse Beatrice is his guide through the heavenly realm of the *Paradiso*. An important structure within Dante's work is the Christian numerological structuring of each of these three realms, which these guides introduce to Dante and the reader throughout the adventure. Dante's description of the Christian metaphysical beliefs gave textual flesh to the ontological structuring of the universe during his time period; in fact much of his work reads like a taxonomical list of objects that existed during his time. Most people are familiar with the seven deadly sins structured in the *Purgatorio*, which were, for example, once again a focus of popular culture in the psychological thriller *Se7en* (1995). The basic structures of the Christian cosmology that Dante uses in *The Divine Comedy* are listed as follows (see Table Seven below):

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[9] "The ELF Project." *The Divine Comedy Research Edition.* May 2003 <http://www.divinecomedy.org/>.

Inferno	*Purgatorio*	*Paradiso*
1. Lust (Beyond the river Acheron) 2. Gluttony 3. Avarice 4. Wrath 5. Sloth 6. Envy (Beyond the river Styx) 7. Pride	1. The Proud 2. The Envious 3. The Slothful 4. The Wrathful 5. The Avaricious 6. The Gluttonous 7. The Lascivious	1. Inconstancy (The Moon) 2. Ambition (Mercury) 3. Earthly love (Venus) 4. Prudence (the Sun) 5. Fortitude (Mars) 6. Justice (Jupiter) 7. Temperance (Saturn)

Table Seven: The Christian Structure of the Divine Realms in *The Divine Comedy*

The nine circles of hell are based on the seven overarching negative values of reason: pride, envy, wrath, sloth, avarice, gluttony, and lasciviousness. Virgil guides Dante down through Hell's levels of punishment structured upon these sins, eventually crossing over Lucifer himself at the centre of the earth's core. These negative values are mirrored in Purgatory, where lesser sinners await to fulfill their punishment and rise to the heavens. Purgatory exists on the opposite side of Earth to that of Dante's *Inferno* and contains the souls of those who have committed sins that were an extension of the harsher-punished sins of the *Inferno* (see Table Seven). Dante uses the opposite values of these seven sins to represent the graceful values of the seven heavenly circles of Paradise. Notably, in this framework, the celestial values are structured according to the planets known at that time. This structuring is important in the Christian sense of a worldview, or ontology, because Dante's cosmology described how a majority of the educated Christians viewed their life experience and place in the world during that time period.

Understanding this worldview is a major shift in thinking from the present empirically-based ideas of the universe; just imagine staring out into the stars and believing that the earth was the centre of the universe with the stars, sun, and planets, spinning around a planet described by the Christian ideal as the most important in the universe; versus that of Copernicus (1473-1543) or Galileo's (1564-1642) views, which would develop nearly one hundred and fifty years after Dante's death. C.S. Lewis describes this major shift of the Renaissance as more anti-Christian than it may appear at firsthand. He writes:

> Their cosmology and their religion were not such easy bedfellows as might be supposed. At first we may fail to notice this, for the cosmology appears to us, in its firmly theistic basis and its ready welcome to the supernatural, to be eminently Christian. And so in one sense it is. But it is not eminently Christian. (18)

Lewis goes on to argue that the mixture of Pagan values and Christian elements are one of the main components leading to the end of the medieval period. He argues that there was "no direct conflict between religion and science" as there is now, but that pagan and Christian values had "an incompatibility in temperament" (18).

Other poets during this time period that influenced the development of Humanism included Giovanni Boccaccio (1313-1375) and Francesco Petrarch (1304-1374). Boccaccio and Petrarch are usually given the status of being the first Humanists because they were mainly interested in describing and using themes that included the ancients and poetry, whereas Dante considered the pagan views of the ancients as sacrilegious unless tempered by a Christian ethic.[10] The turning of these poets' work away from sole Christian authority allowed for studies in human social issues, and eventually Science, to become separated from theology. C.S. Lewis notes that part of this shift was connected to the style of these literary works as being didactic in nature. He writes:

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[10] Klemens, Löffler. "Humanism." The Catholic Encyclopedia. Vol. 7. Robert Appleton Compay <http://newadvent.org/cathen/07538.htm>.

> No one who has read the higher kinds of medieval and renaissance poetry has failed to notice the amount of instruction—of science, philosophy, or history—that they carry. Sometimes, as in the *Divine Comedy* or Lyndsay's *Dreme* or Spenser's Mutability cantos, the theme is so chosen that it permits and invites such matter. (198)

In fact, like Dante's didactic Christian structuring of the universe, the earliest version of the Humanities became entrenched within the educational system through the Scholastic movement's systematic ordering of this structure.[11] The creation of the twelfth-century Christian universities, with Oxford being the first in the English-speaking world (~1096-1170), was modeled on the seven basic liberal arts of the Scholastics, which were 1) grammar, 2) logic, 3) rhetoric, which made up the Trivium; and 4) astronomy, 5) arithmetic, 6) geometry, and 7) music, which made up the Quadrivium.[12] This split of the Trivium and the Quadrivium is modeled on the Platonic system of reason.

In the anonymous fourteenth-century work *The Court of Sapience*, this model of the medieval educational system is personified throughout the narrative. This personification follows the characteristic seven ritualized values of the Christian church, which Dante similarly used to structure his works. E. Ruth Harvey notes in her introduction to the *Court of Sapience* that the seven liberal arts came to the

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[11] Under the direction of the school headmasters who were called "Scholastics" after the Greek term for the original academic mentors of Athens, the student *magistrati* at the early Christian universities learned from the great translations of Arabic preservations of the ancient Roman and Greek masters. The Scholastics generally followed the Aristotelian model of sharing knowledge versus the Platonic Humanist model of preserving an idealized archive or object of knowledge. Avichenna (Persian Born: 981 – 1037), Boethius (~480 AD - 525/26), St. Albertus Magnus (1206 -1280), and St. Thomas Aquinas (~1225/1227 -1274) are credited as major figures during the Scholastic period.

[12] *Oxford University Home Page*. May 2003 <http://www.ox.ac.uk/aboutoxford/history.shtml>.

Christian Middle Ages chiefly through the fifth-century writings of Martianus Capella, Cassiodorus, and Isidore of Seville. She explains how the seven Arts were connected to Christian doctrine through Cassiodorus' work, as follows:

> Cassiodorus was also partly responsible for the tradition that the number of the liberal arts was significant: he held the seven studies to be mysteriously interlinked and to provide in themselves the whole sum of human philosophy, the 'seven pillars' hewn out by the wisdom of God in Proverbs 9:1. (240)

In the poem, each of the seven Arts speaks to the unnamed poet who authored the fragments that Harvey has collected to recreate the original story. *The Court of Sapience* is important as a work that demonstrates the knowledge general medieval and renaissance scholars would have known for the basis to their own writings, which include the etymologies of Martianus and the grammar of Isidore. Most importantly, the basic foundation of this curriculum used the work of Aristotle and Plato's ideas of reason, which asserts, in the poet's words, "suster Trouth, ye may regne as pryncesse / Withoute falshede, and have youre soveraynte /Withoute injure…" (qtd. in Harvey, 379–381). This Aristotelian ideal that all reason is derived from sense-knowledge, which is developed in *The Court of Sapience,* is still held as a core value by "Dame Scyence" today.

Both C.S. Lewis and E. Ruth Harvey's work describe the early twentieth-century ideas of the Humanities and how the medieval period influenced its development. However, theorists such as Foucault, Hardt, Heidegger, Kittler, and Negri believe that these early formations of Humanism really helped to root and form a basis for the spread of elite Eurocentric cultural domination and not just the spread of a more general civil, or social, good; such as the pursuit of intellectual progress. In the neo-Marxist work *Empire* (2000), Hardt and Negri explain that this shift from theology to a reason-focused worldview was a revolution that paved the way for modern economics and nation states. They describe this shift as follows:

> It all began with a revolution. In Europe, between 1200 and 1600, across distances that only merchants and armies could travel and only the invention of the printing press would later bring together, something extraordinary was happening. Humans declared themselves masters of their own lives, producers of cities and history, and inventors of heavens. They inherited a dualistic consciousness, a hierarchical vision of society, and a metaphysical idea of science; but they handed down to future generations an experimental idea of science, a constituent conception of history and cities, and they posed being as an immanent terrain of knowledge and action. (70)

It is important to note in this passage that this resituating of knowledge allowed for Humanism to develop and create the modern human. Hardt and Negri's outlook on the distancing power of Humanism is based in the Marxist notion of Humanism.

In his early writings (1844), Marx offers a definition of communism that is equivalent to Humanism. He defines his idea of communism as follows:

> Communism as the positive transcendence of private property, or human self-estrangement, and therefore as the real appropriation of the human essence by and for man; communism therefore as the complete return of man to himself as a social (i.e., human) being—a return become conscious, and accomplished within the entire wealth of previous development. This communism, as fully-developed naturalism, equals humanism, and as a fully developed humanism equals naturalism; it is the genuine resolution of the conflict between man and nature and between man and man—the true resolution of the strife between existence and essence, between objectification and self-confirmation, between freedom and necessity, between the individual and the species. (84)

Marx believed that to transcend the capitalistic problem of private property would involve all of the previous knowledge of humanity: a progression based on dialectical materialism.[13] Significantly, the formal institution of the Humanities was only beginning to appear in schools around Europe near the end of Marx's life, as opposed to the term of "Humanism" assigned to the Renaissance thinking that Marx was debating.

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[13] See Chapter Three for an in-depth definition of dialectical materialism in terms of consensus and dis-sensus.

The actual development of the Humanities formally comes much later historically than Humanism and after the eighteenth-century Enlightenment era. During the Enlightenment, the Sciences began to develop and would eventually break off from Humanistic inquiry.[14] The entrenchment of the seven liberal arts within education systems may have aided in the development of the Humanities, but it has also helped to foster the current state of the dominant scientific worldview. This shift to Scientism occurred because of the weakening of Christian doctrine as the basic metaphysical system underlying education during the Scholastic period, when students were allowed to study materials that had been previously labeled blasphemous because of their pagan narratives. The appearance of the Humanities in England as a distinct study comes through the work of Matthew Arnold (1822-1888), who is considered another pivotal figure that helped to establish the Humanities. As one of "Her Majesty's Inspectors of Schools," Arnold worked for thirty-five years, traveling widely both in England and abroad as a man of letters. He argued strongly for the case of what we now call the formal Humanities versus the seven liberal arts. He wrote enthusiastically of the Humanities, as follows:

> To know himself, a man must know the capabilities and performances of the human spirit; and the value of the humanities, of *Alterhumswissenschaft*, the science of antiquity, is, that it affords for this purpose an unsurpassed source of light and stimulus [...] But it is also a vital and formative knowledge to know the world, the laws which govern nature, and man as a part of nature. This the realists have perceived, and the truth of this perception, too, is inexpugnable. (Arnold 103)

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[14] For a more in-depth history of this period, the work of Anthony Grafton and Lisa Jardine provides a good summary and literature review of the period in their *From Humanism to the Humanities* (1986).

In this quotation, Arnold espouses a view that the qualitative record of the human spirit is as vital a study as that of the Sciences: a description that definitely presupposes two disciplines. In his criticism of Arnold's *Culture and Anarchy,* Walcott remarks that Arnold's judgments of the Humanities are certainly extraordinary given their respect for both the study of nature, as well as the teaching of letters; especially given that in the same year *The Origin of Species* was published and "the degree of science was instituted by the University of London" (Walcott 104).

In the United States, Levin counts the creation of the National Endowment for the Humanities (NEH) as the official creation of the Humanities in that country, which occurred under the aegis of the Modern Languages Research Association in 1918.[15] Overall, Levin's three definitions of Humanism offer a broad guiding framework for understanding the development of the Humanities and its current standing within global academia, as presented above. Importantly, these definitions of the Humanities do not include any descriptions of quantitative studies, or technological-based studies, as a foundational basis, which would preclude the Humanities from having any distinct voice in technological initiatives during the early years of the twentieth century. The last definition of Humanism that Levin describes as a variant of Humanitarianism will be discussed in more detail below, as regards the life of Martin Heidegger and his ideas on Technology.

As a foreshadowing of that examination and an echo of the *Discarded Image* of Medieval scholarship, Levin's analysis of the Humanities offers a warning about the imperiled state of Humanities funding at present. He writes:

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[15] To note, the formal founding of the Canadian Arts and Humanities comes in 1951, with the creation of the Canadian Arts Council, based on the 1949 Massey Report. For more on this history, please see "The Canadian Council for the Arts Home Page" (2002).

> The mechanization of life has led, as Ortega y Gasset predicted, to the dehumanization of art. If man is the measure of the humanities, our progression may be reckoned by his changing image of himself. (15)

Perhaps, it is best to turn to a reconsidering of the Humanities as a defense against the scientific method in a time when funding for the Arts is dwindling and scientific research is the chief concern at universities.[16] Levin describes Humanities scholars "as custodians of their memory" and the custodians of the world's cultural memory; in keeping with this role, he believes that "…we must do whatever we can to keep their words alive" (15). This idea of memory resonates from Heidegger's "Letter on Humanism" where memory is considered as "the gathering of thought" (369). For Heidegger, it is important to remember whom the custodians of memory are in the Humanities and how these people continue to change what is considered to be important as a memory and what is not.

IV. Reconsidering Heidegger's Humanism and "What Calls for Thinking?"

> That which calls us to think in this way presumably can do so only insofar as the calling itself, on its own, needs thought. What calls us to think, and thus commands, that is, brings our essential being into the keeping of thought, needs thinking because what calls us wants itself to be thought about according to its essence.
>
> - Martin Heidegger, "What calls for Thinking?" (390)

As was presented in Chapter Two, Heidegger's phenomenological studies are generally viewed as a move away from Humanism because he removes man from the centre of his metaphysics and turns to "Being" as the focus of his study.[17] This quotation above is characteristic of Heidegger's difficult writing style, which was criticized as abstract and containing undercurrents of Nazi and Christian values in Chapter Two. Despite Heidegger's controversial life decisions, one of the major essays in the last one hundred years concerning Humanism is his "Letter on Humanism" (1947). However, even this letter is often criticized as far too abstract to be useful practically. For example, Luc Ferry and Alain Renaut introduce their essay on Heidegger's ideas of Humanism as follows:

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[16] This shrinking funding of the Arts is no secret. For an example of this situation, the University of Alberta's own on-line newspaper can even be consulted: see Ryan Smith's article "Arts faculty plans for fiscal restraints" (2003). Or, for a broader view of this issue, please see Mary Poovey's "Twenty-First-Century University and the Market: What Price Economic Viability?" (2001).

> Until recently, Martin Heidegger's philosophy attracted and repelled, with equal intensity, a large number of American readers. To his admirers, Heidegger was one of the great philosophers in history, the thinker who understood most clearly the impasse that Western technological civilization is supposed to have reached, who may have had a glimpse, if only dimly, of another world. To his detractors, Heidegger was an obscurantist with an odious political past, with a talent for coining impenetrable neologisms that appear to display deep understanding but really serve only as a barrier to systematic, rational criticism. (1)

Similarly, Heidegger scholar Anson Rabinbach criticizing the letter by saying that it "is notoriously silent on the Jews, yet has achieved canonical status both as a founding document of deconstruction, and as an extraordinary discourse on the apocalyptic collapse of Western metaphysics into nihilism and a plea to return to the shelter of Being" (1). Despite the controversy, the "Letter on Humanism" has helped to develop new ideas on Humanism in the modern world.

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[17] Heidegger's definition of Being is as follows: "Yet Being—what is Being? It is It itself. The thinking that is to come must learn to experience that and to say it. 'Being'—that is not God and not a cosmic ground. Being is farther than all beings and is yet nearer to man than every being, be it a rock, a beast, a work of art, a machine, be it an angel or God. Being is the nearest" (Heidegger 234). For a helpful paraphrase of Heidegger's abstract definition, Korab-Karpowicz's (2001) description is provided as follows: "Being is to be grasped by means of the phenomenological method. However, being is always the being of a being, and accordingly, it becomes accessible only indirectly through some existing entity. Therefore, 'phenomenological reduction' is necessary."

In his letter, Heidegger considers a list of "Humanisms" and the definitions that many philosophers preceding his own inquiry and cultural history have investigated, including definitions similar to those analyzed in Levin's work. He finds that each definition for the term Humanism is tightly enclosed within each metaphysical system of inquiry: from Sartre's existentialism, Marx's social/natural Humanism, Nietzsche's Humanism as "eternal return," through to Christian Humanism, and all the way back to Platonic Humanism. Rabinbach summarizes the letter as follows:

> The Letter begins with Heidegger's famous distinction between the essence of man and the essence of truth. Only thought concerned with Being, never "action or praxis," can reveal the latter. Neither man's existence nor will, but Being itself is the source of action. Occidental thought has reversed this relation, substituting essence or existence for the Truth of Being. The source of this fatal reversal is a primordial event: at an early stage in the development of Western "logic" and "grammar," metaphysics "seized control of the interpretation of language" and posited subject and object as appropriate terms to define the human condition. The Letter on Humanism is an attempt to liberate language from this grammar: to forego Western metaphysics and return to the essence of thought, which is the truth of Being. Its most famous sentence asserts that this thinking occurs in language, which is "the house of Being." (3)

In this search for the truth of Being, Heidegger argues that Platonic Humanism, and all other definitions of the term, is based in the idea of "the rational animal." He states the following about the idea of the rational animal, "The beginnings of that interpretation lead back to Plato and Aristotle. They take thinking itself to be a *techne*, a process of reflection in service to doing and making" (218).

The truth that Heidegger identifies by analyzing these previous metaphysical systems, or by looking anew at the phenomenon presented, is that as long as Humanism is aligned with a singular, modern, linear notion of Being -- be it Nietzsche's theory of "eternal return" or the Platonic "animal rationale" -- Humanism will remain an anti-Humanism. He believes this because the "essence" of man must encapsulate all of these definitions and more. He writes:

> Should we still keep the name "humanism" for a "humanism" that contradicts all previous humanism—although it in no way advocates the inhuman? (248)

A true definition of Humanism must encapsulate all of these theories not simply because all of these metaphysical systems are theories of Humanism and can be studied in the Da-sein (or the clearing of Being), but because their sum total still does not find or define the essence of "Humanism."[18] The subject of Humanism is an impractically abstract subject that falls far away from a direct closeness of Being because of the incapability of language to describe things in a one to one relationship.

A Humanism for Heidegger would include items pulled from the category of irrationalism, things that can not be written of, phenomena of the imagination, animal articulations that resonate from the rational animal that man is, and the more of everything in experience (and outside of it) that humans are a part of, and a part in, through this Dasein (Being) and Zeit (Time). He believes that "Language is the house of being" (217) and "Man is the shepherd of being" (245); these statements represent a desire to keep literacy and man as central components of his ontology. The ultimate designer of this framework of Being and Time for Heidegger remains unknown. Therefore, no direct judgment can be passed on a God that humans do not have access to inquire about. In other words, God does not appear directly in Heidegger's metaphysics; however, many critics, as was discussed in Chapter Two, identify his couched nationalistic and religious ideals, which include his need for a "homeland" and the need for German Being to be central in becoming "world-historical" (242).

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[18] Heidegger's definition of Da-sein is as follows: " 'Only so long as Dasein is, is there *[gibt es]* Being'? To be sure. It means that only so long as the clearing of Being propriates does Being convey itself to man. But the fact that the *Da*, the clearing as the truth of Being itself, propriates is the dispensation of Being itself" (240). Again, Korab-Karpowicz's work (2001) provides a useful paraphrase of this definition of Dasein, which he defines as "Human existence […] in respect to its temporal and historical character."

Without going into more detail about Heidegger's philosophy at this time, I will highlight the importance that Heidegger places on the rigor of thinking and using proper wording "to bring ideas to language" as a focus of Humanistic thought.[19] In his letter, Heidegger is one of the first scholars in the twentieth century to emphasize the need for the Humanities as a counterbalance to modern rationalism; this is an emergency that is surprising given his life decisions. His warning is generally summed up in his phrase "Most thought-provoking in our thought-provoking time is that we are still not thinking" (371). In essence, for Heidegger, humanity and Humanism can only be defined as narrowly as the wide berth of which our collective minds and imaginations will allow. In other words, Heidegger's notion of ontology removes humans from its focus and shifts it to "Being" in general.

Some critics argue that this shift is an anti-Humanistic shift; however, this debate is still on-going (Collins, 2000). For now, I have presented two ontological models of the Humanities:

1. The original model entrenched in the seven liberal arts based in Christian metaphysics, which included an ontology of the earth as the centre of the universe by Godly design. This is an ontological model that still influences the Humanities as socius to some degree and from which that Humanities

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[19] Heidegger's definition of "Thinking" is "Said plainly, thinking is the thinking of Being. The genitive says something twofold. Thinking is of Being inasmuch as thinking, propriated by Being, belongs to Being. At the same time thinking is of Being insofar as thinking, belonging to Being, listens to Being. As the belonging to Being that listens, thinking is what it is according to its essential origin. Thinking *is*—this says: Being has fatefully embraced its essence" (220). Korab-Karpowicz paraphrases Heidegger's definition of "Thinking" as "In distinction from mastering beings, the thinking of thinkers is the thinking of being."

have evolved.

2. The other model is based on Heidegger's description, where Humanism and the Humanities can be defined as broadly as anything that includes the analysis of human existence and being; this definition could even include scientific and technological investigations, which would include studies of the Semantic Web.

Is it the case that the overriding Scientism of our times is currently reducing Humanism into a marginalized socius, dominated by Science's hegemonic, globalized empire in a single technological state of living; or in Deleuze and Guattari's terms, as a singularly inscribing socius? Or, is it the case the Humanities are alive and well – and simply evolving into a more inclusive definition such as Heidegger describes?

V. The Hypermodern Balancing Act of Humanities Computing

> Humanities Computing has benefited from the constant struggle to define itself as a discipline to any substantial degree of consensus. Indeed, it may even be suggested that the constant search for identity has been a defining characteristic of Humanities Computing. The seemingly unstoppable and fast-paced march of technological progress – and by extension of potential ways of using technology in humanities research – should make us wary of efforts to encapsulate Humanities Computing into a list of acceptable perspectives and methods that are supposed to have any universality or permanence. (Sinclair and Gouglas 2)

Sinclair and Gouglas describe the struggle to reach consensus that is a basis of the interdisciplinary Humanities Computing field. Their work provides a succinct review of the successful creation of the Humanities Computing (HuCo) graduate program at the University of Alberta. They believe in accordance with Willard McCarty and Geoffrey Rockwell that, despite the long history of Humanities Computing scholarship which "stretches back at least half a century" (3), institutional recognition of Humanities Computing requires local circumstances and not an external, predefined disciplinary standard. At the University of Alberta, these circumstances included 1) the necessary faculty who would lead the program, 2) the research projects available at the institution in which to root this research, 3) the physical infrastructure of computers and buildings, and 4) the student demand (3). These factors are evidence of the complex considerations that are required to create a new program of study at any institution, given the hypermodern interdisciplinary model that many programs must now work to achieve.

Sinclair and Gouglas refer to Geoffrey Rockwell's experience of putting together the undergraduate Multimedia Program at McMaster University in Hamilton, Ontario, in their literature review (2). Rockwell is a leading Humanities Computing scholar, and in his article "Is humanities computing an academic discipline?" (1999), he describes the experience of that program's creation in order to provide advice to other Humanities Computing projects that people might be interested in developing or that already exist. He argues that there are many competing definitions of the term "interdisciplinary." Interdisciplinary study can mean any of the following things:

1) Study between two, or among more than two, disciplines.
2) Study between two, or among more than two scholars, of different disciplines.
3) Lastly, interdisciplinary or multidisciplinary study can also mark the limits of a discipline and poses directions for new disciplines to form.

At the University of Alberta and at McMaster, all of these forms of "interdisciplinary" study can be applied to the practice of Humanities Computing found there. In considering these definitions, Rockwell concludes that an element of care and humanitarian ethics are needed to foster the Humanities Computing discipline. He aptly uses Plato's *Phaedrus* (360 BCE) and Mary Shelley's

Frankenstein (1817) to represent his concerns, which would place humans as a focal point of care and control in their relationship with and to technology. This definition can be viewed as a step back from Heidegger's formulation of "Being" as the centre of Humanities studies. Rockwell writes:

> Socrates in his unrealistic Platonic way would have us be philosopher-midwives who judge the health of the children of our thought and abandon those found wanting. Mary Shelley confronts us with a technologist who does just that and is haunted by his abandoned creation. In her story the question is not what do we make, but how do we respond and care for our inventions. Computing is here in the humanities, the problem is to do with it once we have overcome our anxieties? Our students want to participate in the discovery of raising this invention to an unforeseeable maturity. We can ignore the call to play with computing and leave it to its own horrific devices or we can pay attention to it and care for it in the ways we care for other artifacts, through study, through artistic interpretation, through dialogue, and through teaching. (15)

In modern terms of legitimating "progress" and forming a discipline, the progress narrative is tempered by an ethic of care in Rockwell's work, and this theme is reminiscent of the work of Castells, Latour, Mattelart, Menzies, Pfohl, and Virilio, which I described earlier. In postmodern terms, Rockwell's questioning of a blind faith in technology is important support for new Humanities Computing initiatives given the criticisms of Critical Theory and Cultural Studies that I have foregrounded above. The interdisciplinary model that he develops is not a singular, linear modern model; instead, he describes a broad and loose working administrative model. And in hypermodern terms, Humanities Computing becomes emblematic of the complex, interdisciplinary model of this era, where multiple informational flows through an individual socius become just one more survival tactic for humans among the many modern soci.

As was documented throughout this thesis, scholars in Critical Theory, Cultural Studies, and Political Economy within the Humanities often provide a voice of dissent and resistance to neo-liberal ideology in hypermodern informational flows. This voice of dissent is getting harder to hear with new emphasis being placed on technological projects in Humanities Computing and the links that such projects have to commercial endeavors, as was detailed in Chapter One. Similarly, the limitations of the Semantic Web that were highlighted at the beginning of this thesis can be tempered by Rockwell's balancing of a care ethic while introducing new methods and technologies into Humanities studies. In light of such an ethic of care, I believe that this thesis can be viewed as a prelude to more Humanities Computing studies of the "progress narrative" that would identify strains of this narrative in a systematic database or offer methods of providing a critical structure for reducing the negative effects of a market economy on the Humanities system. If there is any alternative to how certain Humanities Computing projects are proceeding based in a neo-liberal pattern, I believe that the work of such theorists as Castells, Latour, Mattelart, Menzies, Pfohl, and Virilio can provide foundations and paths that have yet to be explored within this developing interdisciplinary field, which is currently being configured and reconfigured in the hypermodern era.

Such an elaborate project of Humanism's theoretical reformulation is far beyond the scope of this essay. However, I have included a final note here to suggest a future project, which I might entitle "Systems Splicing." For an example of this "System Splicing" project, Winthrop-Young (2000) writes about the failed attempts to negotiate an amalgamation between differing theoretical frameworks in both the Arts and the Sciences. He writes:

> What Norbert Bolz once said about the (non)relationship between Critical Theory and poststructuralism also applies to that between media science and systems theory: the parties involved are not even capable of defining the level on which they constantly misunderstand each other. In one respect, at least, Luhmann was right: the ongoing attempt to fuse his theories with Kittler proves the axiom that communication is catalyzed by the constant deferral of an always improbable consensus; for if consensus were achieved, what would there be left to communicate? The rest would be silence. (416)

Silences have been very important in my genealogical analysis throughout this thesis. Outside of the Humanities, I argue in agreement with Winthrop-Young, who argues that the Sciences have presented a practical stance in "splicing" networks and systems that might allow for a useful reformulation of the Humanities disciplines. Specifically, Young describes how Kuhn's idea of paradigm shifts in *The Structure of Scientific Revolutions* (1962) is taken into the hypermodern era by such people as Kittler or Luhmann. He discusses how Luhmann's system theory would be the theoretical hardware and Kittler's media theory the software of contemporary critical theory. In a hypermodern era composed of information overload, light-speed time expectations, and limited resources, I believe that "systems splicing" as a survival tactic, might be a bare minimum for intellectuals today who urgently make a "Plea for Time" (Innis, 1951), especially because of the dwindling funding of Arts education and the demands of the labour market.

I hope that a general understanding of my "System Splicing" theoretical leanings have been manifested in this analysis of the Semantic Web and the Humanities. Through the ontological analysis of three soci and their representative informational flows, I have demonstrated that the modern disciplines of Critical

Theory, Cultural Studies, and Political Economy have important messages that can help the developing Humanities Computing discipline and its use of new technologies like the Semantic Web. This gap in the literature of Humanities Computing is important because these voices, as presented herein, argue for:

1) A questioning of how the Computer Sciences and the Humanities are influencing one another.
2) A questioning of how models of consensus are becoming less rigid and more interdisciplinary.
3) A questioning of how the Western global economy is now based in the hypermodern information age.

The technology of the Semantic Web is an example of an attempt to formulate a new solution to the limitations of older technologies. Its hierarchical ordering process does not solve all of the previous problems of older technologies; however, the Humanities and Humanities Computing can be both a site of criticism and care when it comes to this new technology if new articulations of how the use of the "progress narrative" is affecting neo-liberal ideology and the socius of the Humanities are criticized, evaluated, and identified in order to preserve a greater social or civil good. I have attempted to represent the ideas and criticisms of theorists like Castells, Latour, Mattelart, Menzies, Pfohl, and Virilio in order to further conversation and debate among these varying fields within the Humanities.

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